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Lectures  
on the  
Institutes of Physic  
By

Wm Cullen M.D.

Professor of Medicine  
in the

University of Edinburgh

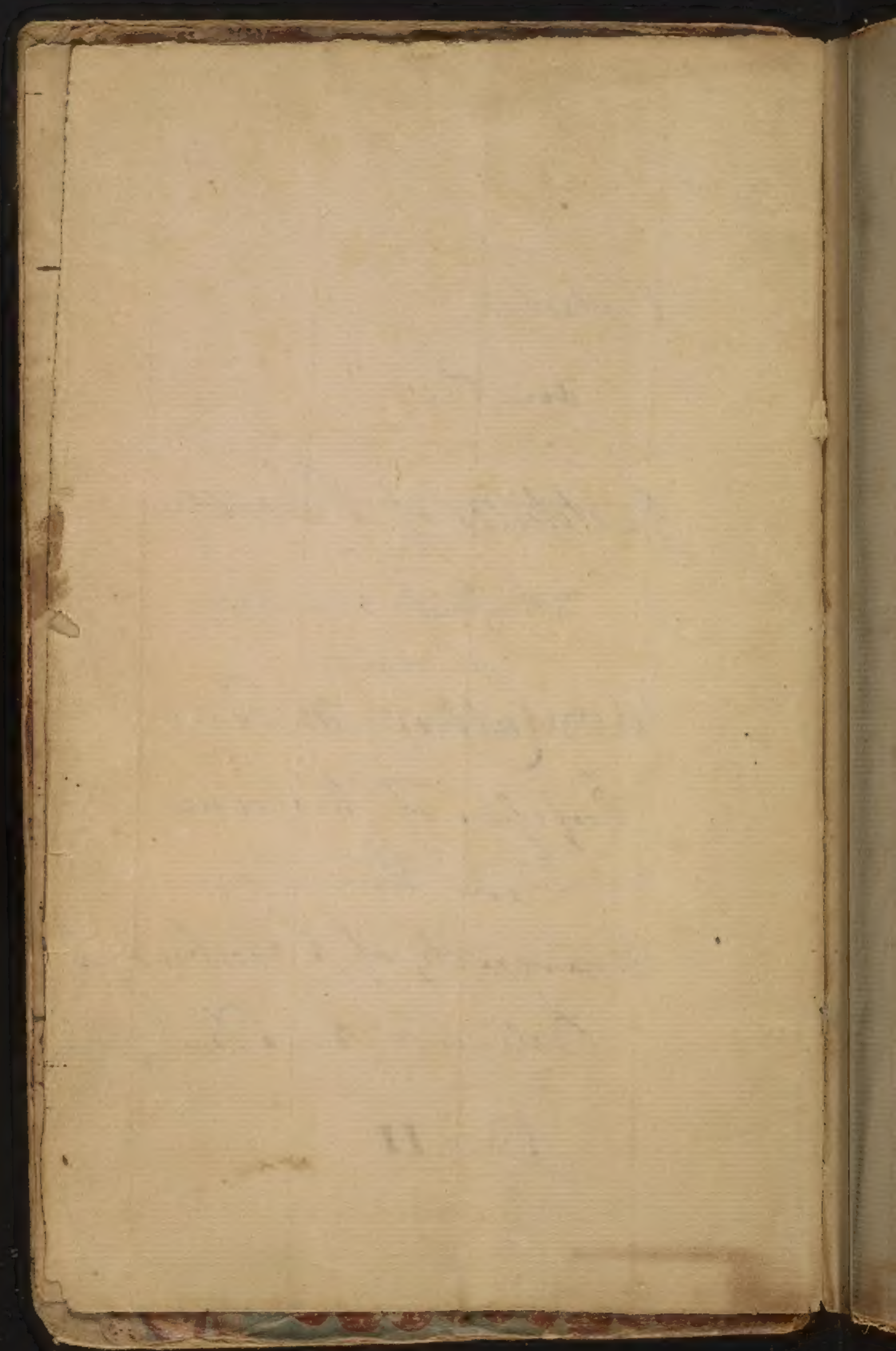
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Vol: **II**

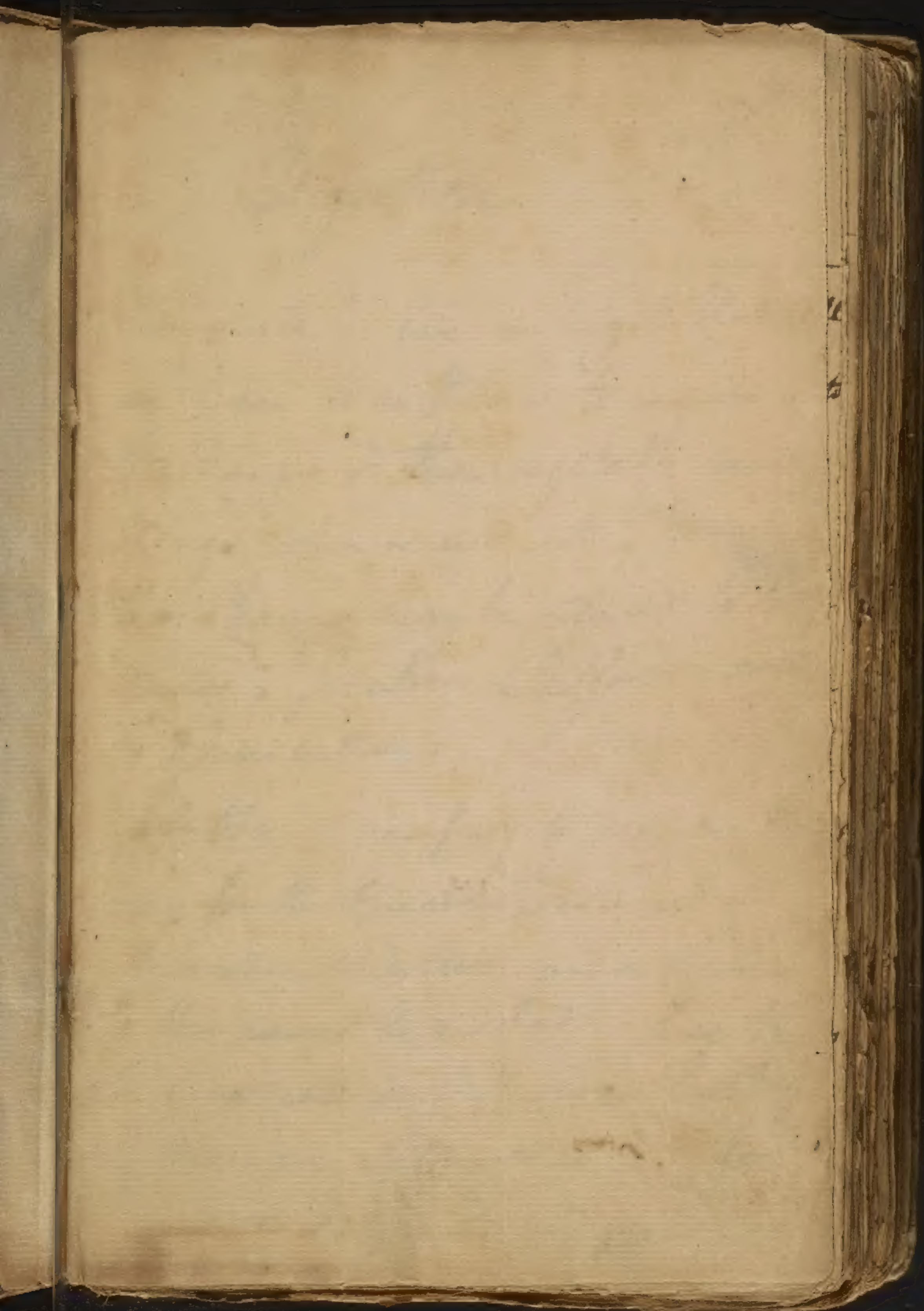
Written by

Benjamin Rush

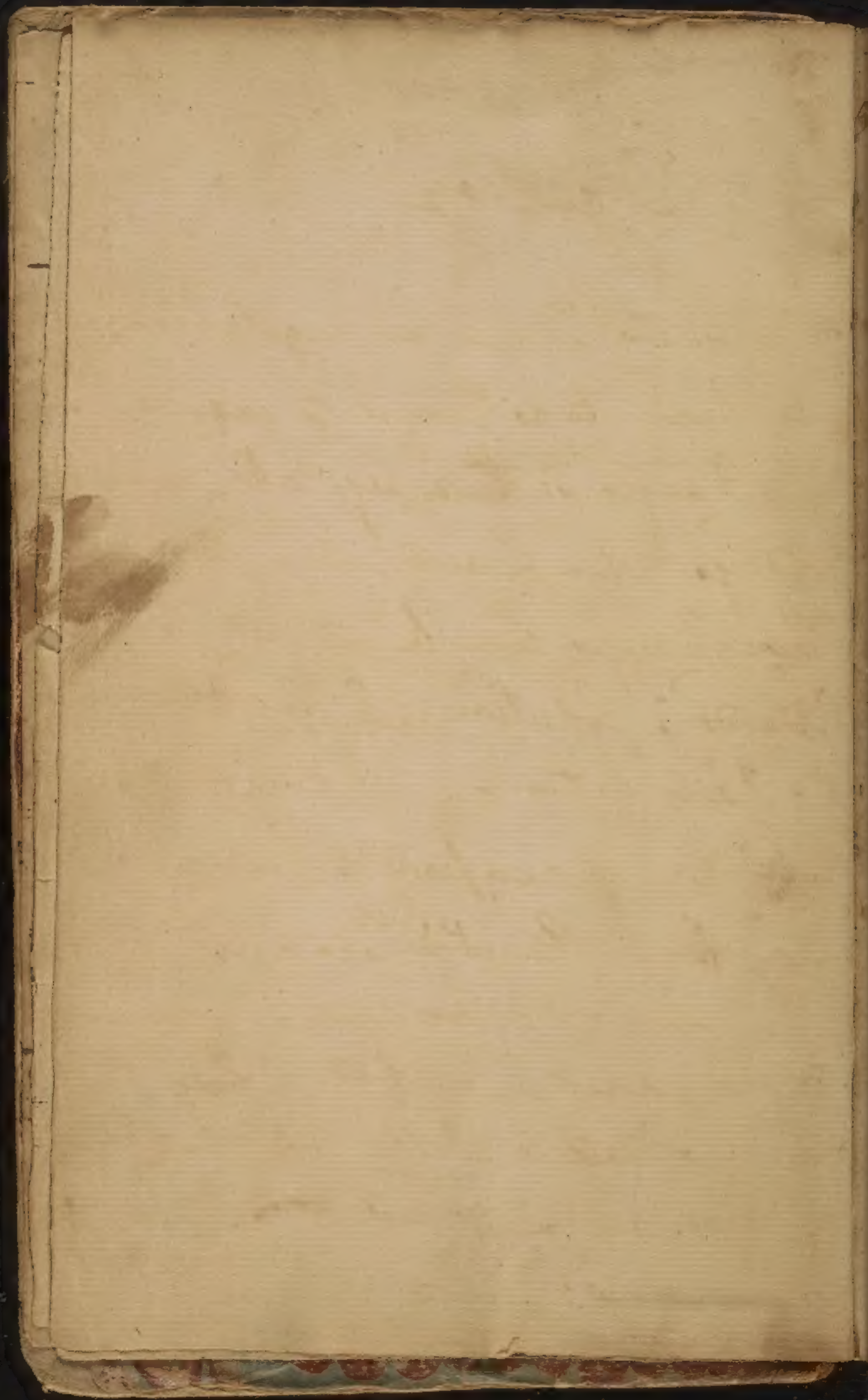












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# Digestion

Animals <sup>th</sup> live on vegetables - all we have to do then is to enquire into the changes <sup>th</sup> these vegetable matters undergo when received into <sup>th</sup> stomach - these changes may be reduced to three heads: 1. solution 2. Diffusion and 3. Assimilation.

Solution is necessary to prepare the way for the Operations <sup>th</sup> succeed it.

But some matters are so heterogeneous <sup>th</sup> they cannot be dissolved, hence then we must call in Diffusion. But neither of these are sufficient to <sup>th</sup> Assimilation for <sup>th</sup> changes <sup>th</sup> Food undergoes, we



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## Digestion

must therefore call in Assimilation  
Solution is performed by the action of  
 the stomach - by its Heat - & by cer-  
 tain Menstrua as the saliva, and  
 Gastric juice and the Drinks we take in:  
 are for the most part water. we shall  
 hereafter speak of the nature of saliva  
 under the head of Secretion. the Gastric  
~~Liquor~~ Liquor appears to be secreted in  
 large quantities & poured out into the  
 Stomach. to all these we may add the  
 mucus secreted in the Oesophagus. all  
 these fluids taken together appear to  
 have no other action than common  
 water. Agitation is necessary



*[Faint, illegible handwritten text, likely bleed-through from the reverse side of the page.]*

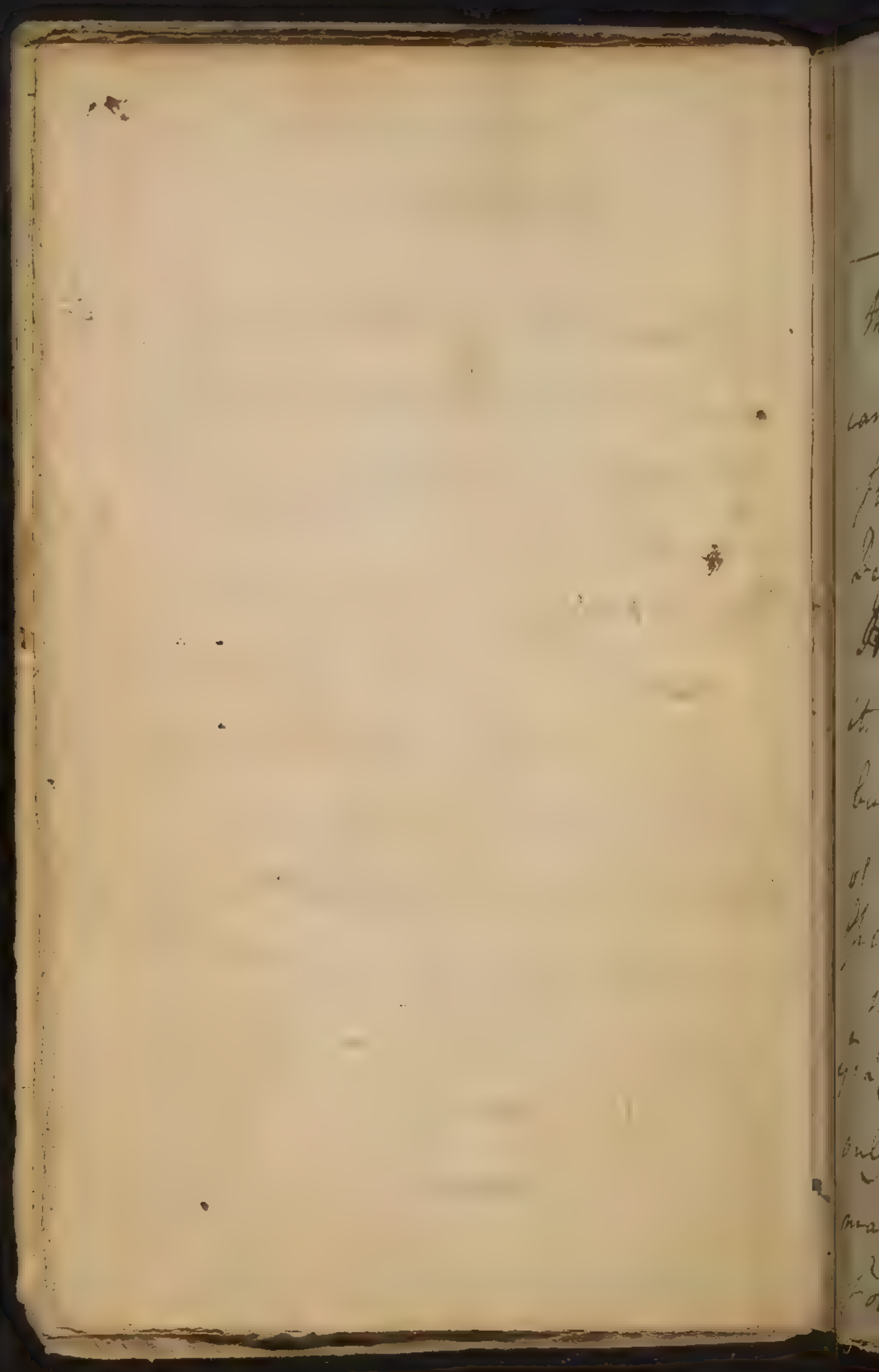
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## Digestion

to promote this Solution in Order to  
 suspend the matter to be dissolved. This  
 Agitation is occasioned chiefly by a  
 Peristaltic motion in the stomach. every  
 Other kind of Agitation is trifling and  
 does not deserve our notice. Another Assistance  
 to Solution is Heat. Some have supposed  
 it to be a principal power. but this is  
 false. it never exceeds  $98^{\circ}$ . Such a de-  
 -gree of Heat but little increases the dis-  
 -solving power of water. a Degree of Heat  
 above  $98^{\circ}$  coagulates Animal matters.  
 So  $y^{\circ}$  it is ~~un~~ necessary to call in  
 a higher Degree of Heat  $y^{\circ}$  we have.







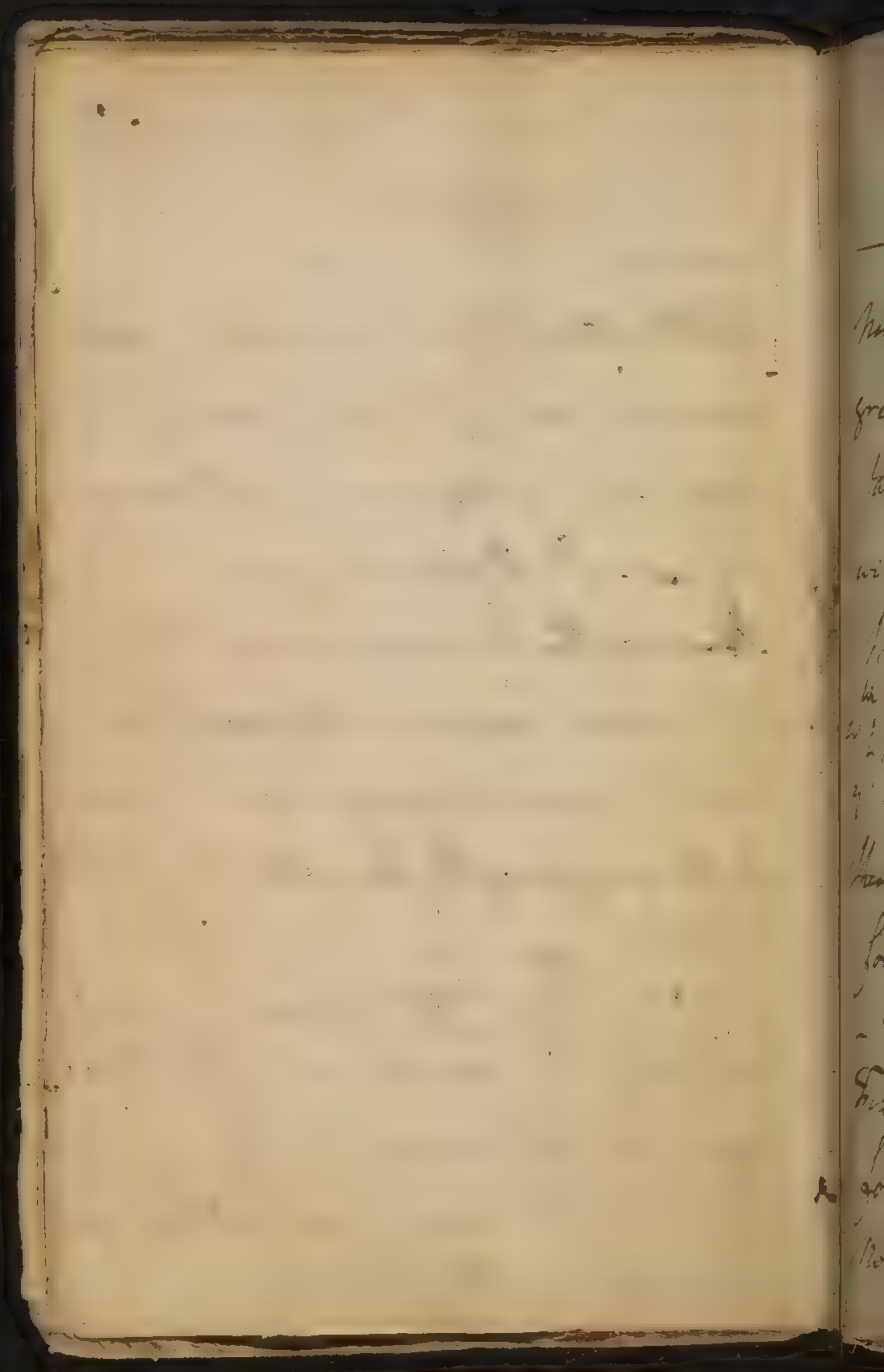
## Digestion

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The Heat of the circumjacent Viscera can add nothing to the Heat of the Stomach as they never exceed it by 1 Degree. Dr. Haller imagines y<sup>e</sup> the Heat of the stomach is increased by its Crispe being shut during Digestion but he is mistaken for no such shutting of the Crispe of the stomach ever takes place.

many Physiologists have supposed y<sup>e</sup> Digestion is carried on by this solution only. but this cannot be, for we find many matters are incapable of solution in the Stomach.







## Digestion

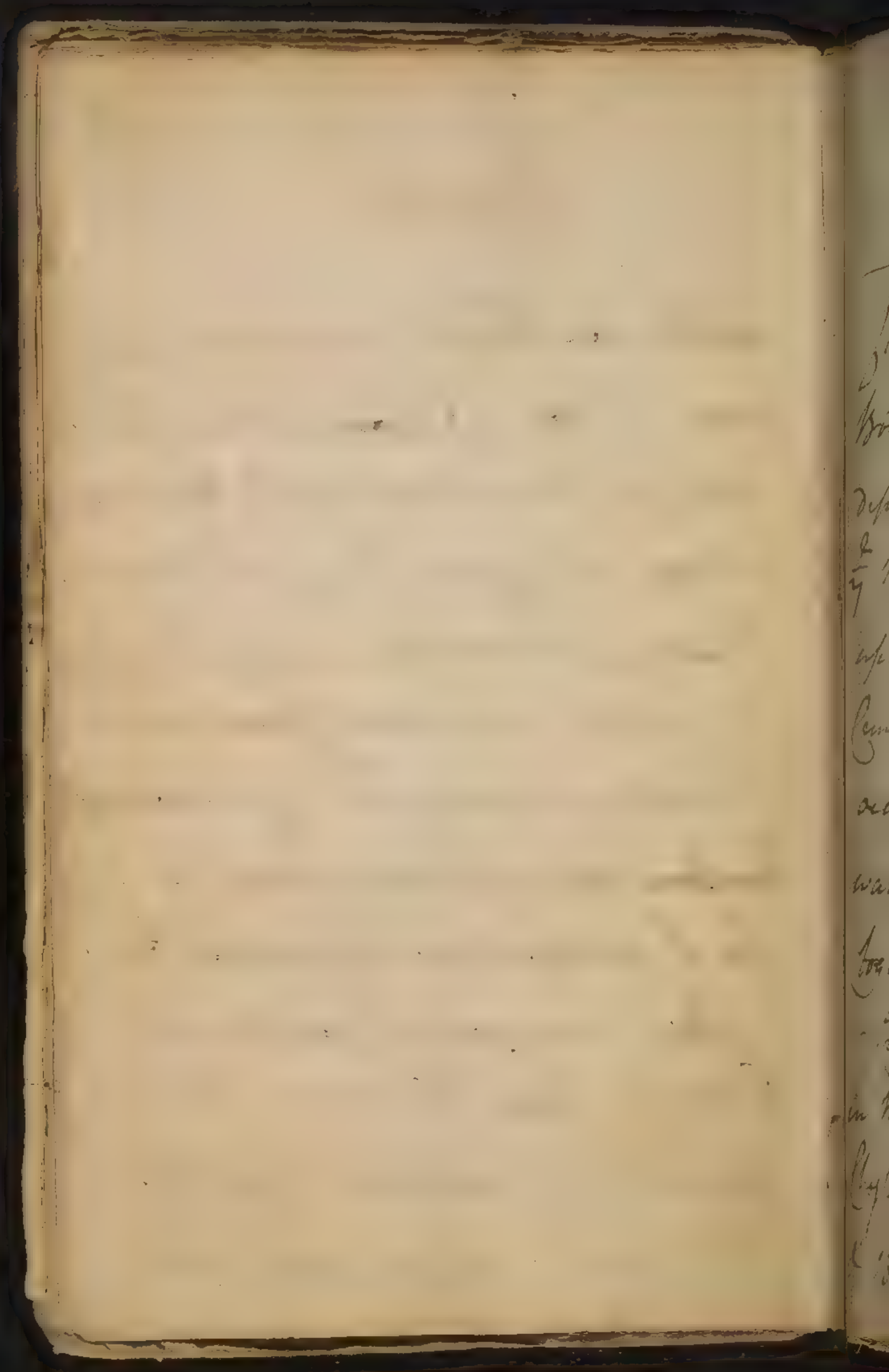
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Neither can Triture Alone have any great Action. I have known Stones, hard pus & even Soap = pills discharged without undergoing the least change.

Besides we never can by any Experiment<sup>th</sup> w<sup>th</sup> Solution or Triture form a liquor y<sup>e</sup> has any Analogy w<sup>th</sup> Chyle. We must therefore call in another power to Aid<sup>r</sup> for Digestion viz: Fermentation.

- This power acts by extricating Fixed Air from Aliment, & thus forwards its Resolution. To be Notice here I do not suppose





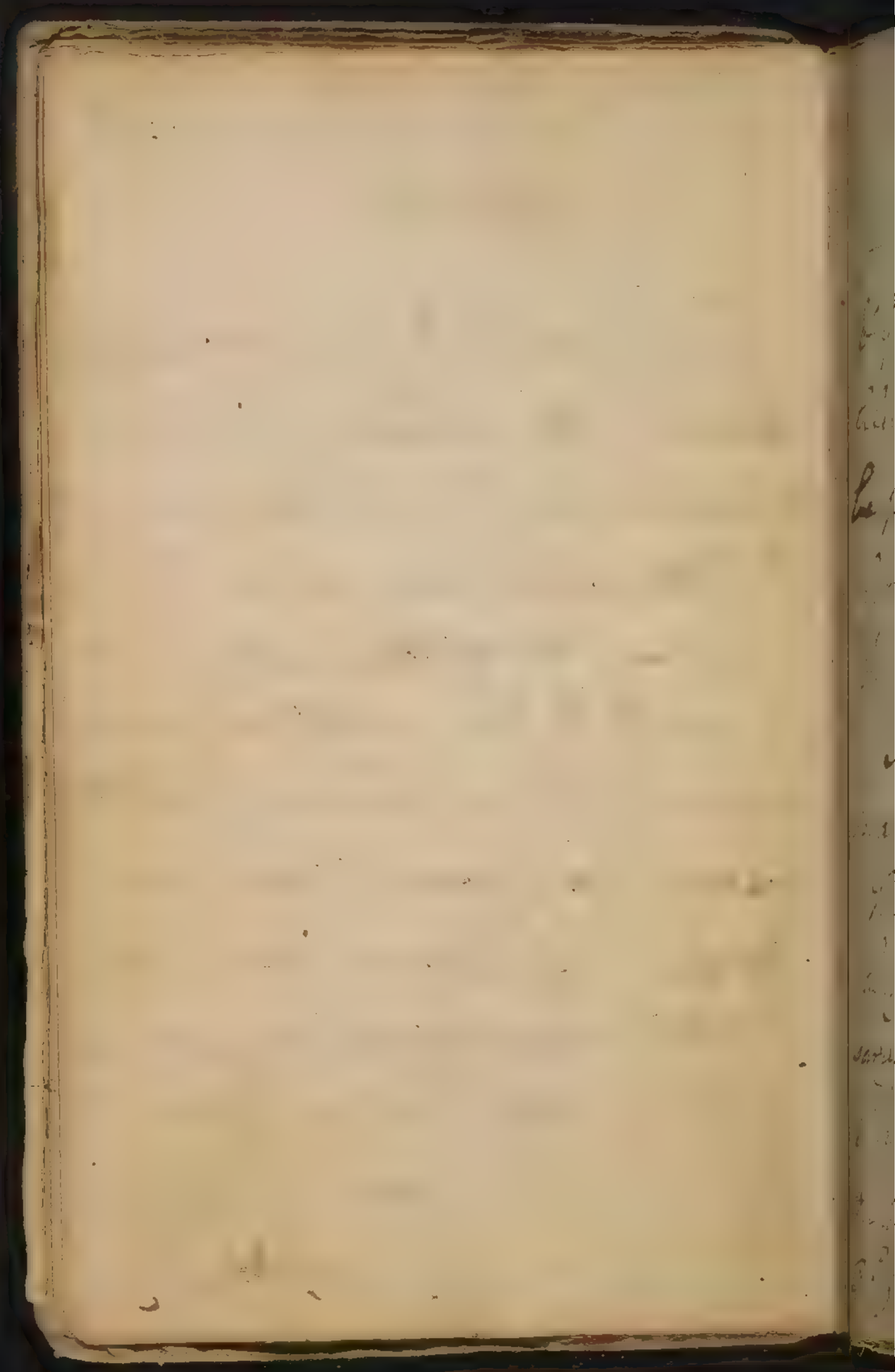


## Digestion

Fixed air to be  $\frac{1}{2}$  Cement of solid Bodies. the Attraction of cohesion depends upon  $\frac{1}{2}$  joint nature of all  $\frac{1}{2}$  Bodies which compose it, & not upon any One of them acting as a Cement to the Rest. a difficult Problem occurs here & y<sup>2</sup>: is how are  $\frac{1}{2}$  oil & watery parts of our Aliment mixed together? I believe they are never mixed.

- the Oil appears only to be diffused, even in the Milk itself w<sup>ch</sup> is formed from the Chyle. Some suppose the Saliva & Bile to be of a laborious nature.





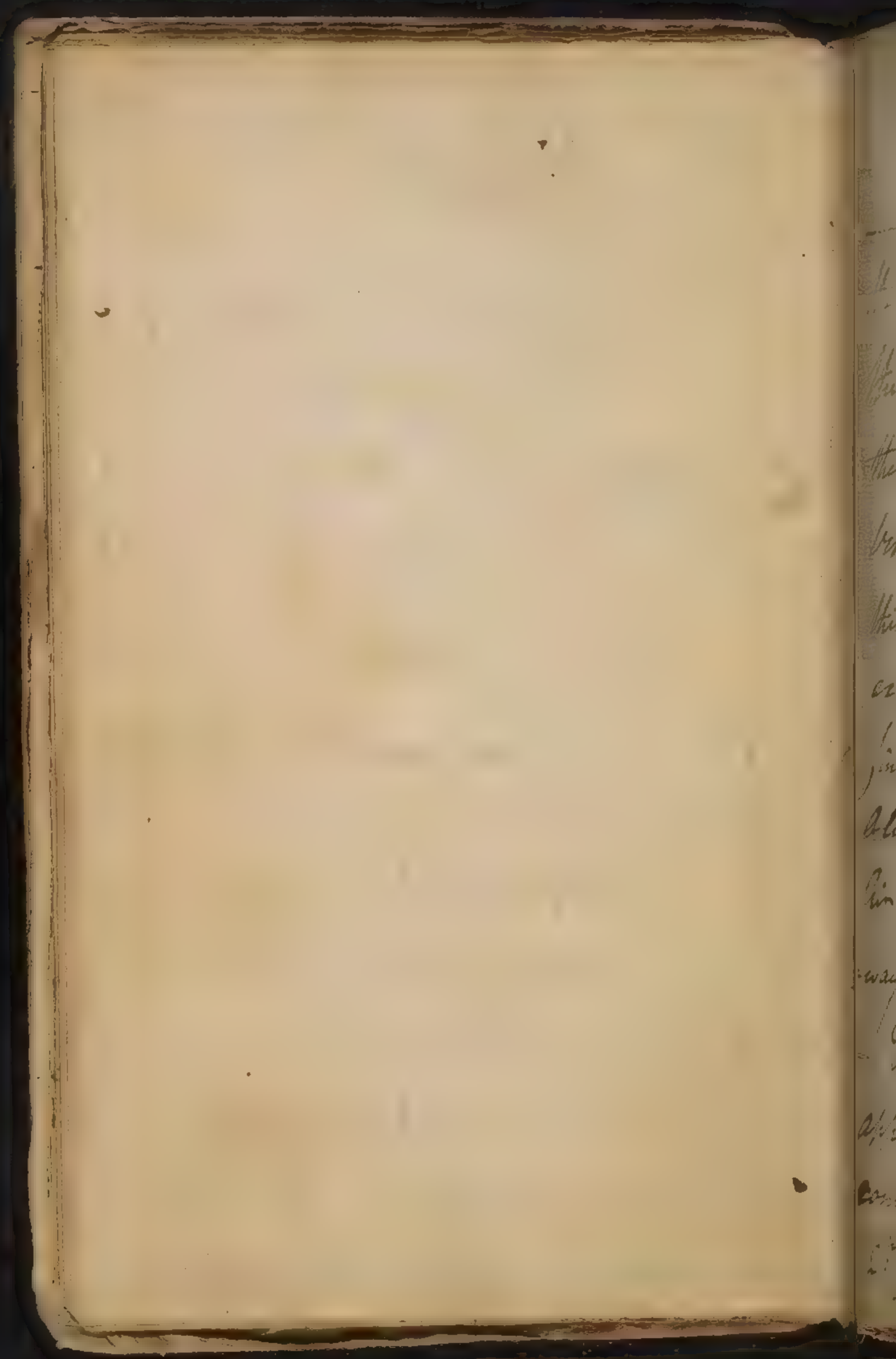


# Digestion

By the way, the food & water of man  
 contains but few fluids to  
 be supposed of any kind of a phosphorus,  
 & I think we ought to guard  
 these kinds of animal transmutation.

In what manner are our alimentary  
 matters assimilated? - By assimilation.  
 Then we have a process of assimilation  
 which is capable of assimilation, & we  
 surely understand it 2<sup>nd</sup> from the  
 phenomena of digestion, which  
 is a process of assimilation of the  
 food from the food of the stomach &c.







## Digestion

In this process. how far does  
 the Fermentation extend? - to  
 the Rictous State. ~~How~~ does the  
 Vinous State precede it? - we know  
 this kind of Fermentation tends to  
 extricate Mephitic Air, which we  
 find is always extricated from our  
 Aliment under the name of Mephitic  
 Air. Is this Vinous Fermentation al-  
 ways necessarily previous to <sup>the</sup> Rictous?

This I cannot determine Altho it  
 appears probable & possible being the  
 common course of fermenting Bodies.

2<sup>nd</sup> from a sweetish breeding & Rictous. <sup>or</sup> ~~fermenting~~



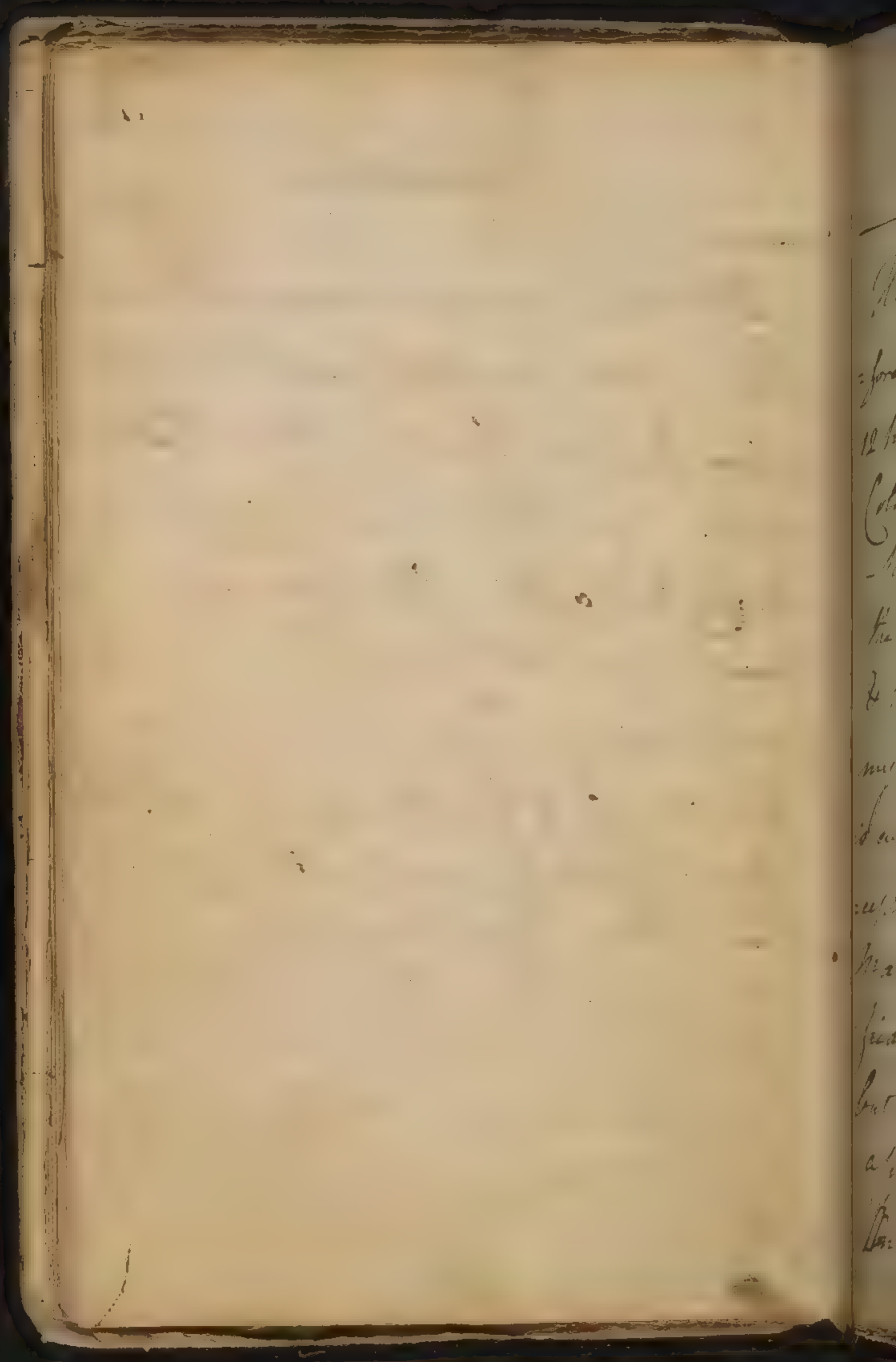
1 a) See Dr Ramsay's Experiments  
1 b) the Mephitic Air exhaled from the  
Lungs may arise 1<sup>st</sup> from a Fermentation  
or incipient Putrefaction going on in the  
Blood, or 2<sup>nd</sup> from a mixture of the Chyle  
& Blood together.



## Digestion

Dr. Haller mentions many authors w:<sup>ch</sup>  
 I have not been able to read who all de-  
 -clare they have found an Acid in y<sup>e</sup> Stom-  
 -ach. all Patients when they throw up  
 the Contents of their Stomachs, show the  
 marks of an Acid in it. This Acid is destroy-  
 -ed by mixing w:<sup>th</sup> the Bile by w:<sup>ch</sup> means  
 the Bitterness of the Bile as well as the  
 Acidity of the Aliment is blunted, &  
 from this is formed that bland Liquor we  
 call Chyle. This is absorbed into the Lactals.  
 But how? Is it by Capillary, or Re-  
 -sultive Attraction? - Dr. Boerhaave & many  
 Conjecture that has been formed, concerning  
 the further Changes of y<sup>e</sup> Chyle is vague and  
 uncertain. C. 4





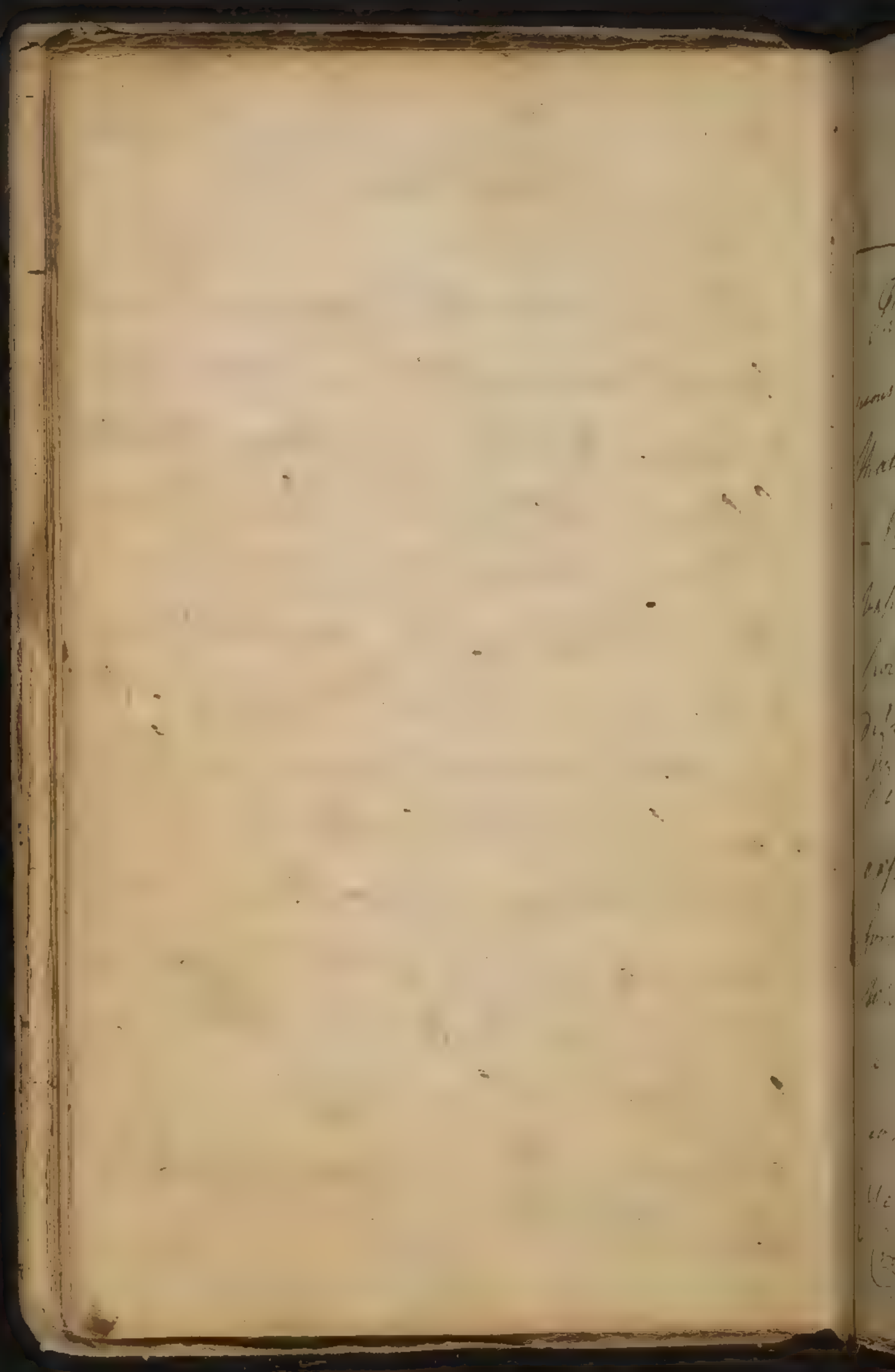


## Assimilation

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How long does the Chyle continue before it becomes Blood? - Some suppose 12 hours. This they infer from the white Colour on Blood drawn from y<sup>e</sup> Arm. - But this white Colour depends upon the separation of the coagulable Lymph & has no connection w<sup>th</sup> the Chyle. for my part I cannot imagine y<sup>e</sup> Chyle is ever found in the Aortic System except in the case of Secretion in the Mammae. It is probable the sanguification is not perfected in the Lungs, but I doubt whether Chyle ever appears after it has circulated once thro' the Lungs.



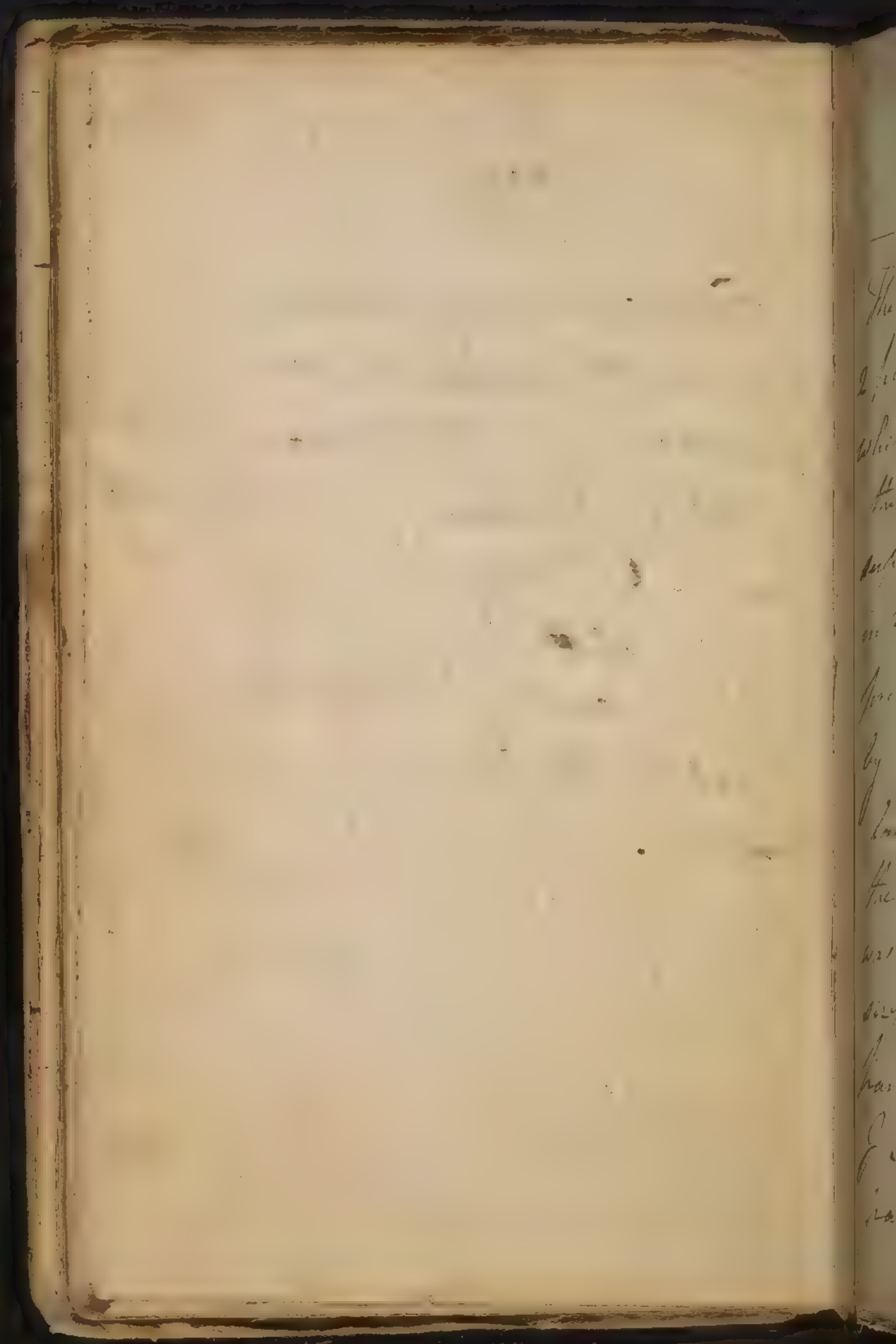




## Blood

This Fluid appears to be a ~~homogeneous~~ mass, but Experiments teach us that it is a very heterogeneous mass.

— Blood when drawn emits a sensible vapour & w<sup>th</sup> that loses a sensible portion of its weight. This portion differs according to the Degree of Heat, or the Quantity of Blood exposed. When the Blood coagulates it forms a gelatinous mass, & after a while separates into 2 parts. The one a solid red part, the other a fluid cankerous part or sometimes a little yellow. The 1<sup>st</sup> is called Serum, ~~the~~ Crassamentum. the 2<sup>nd</sup> Serum.

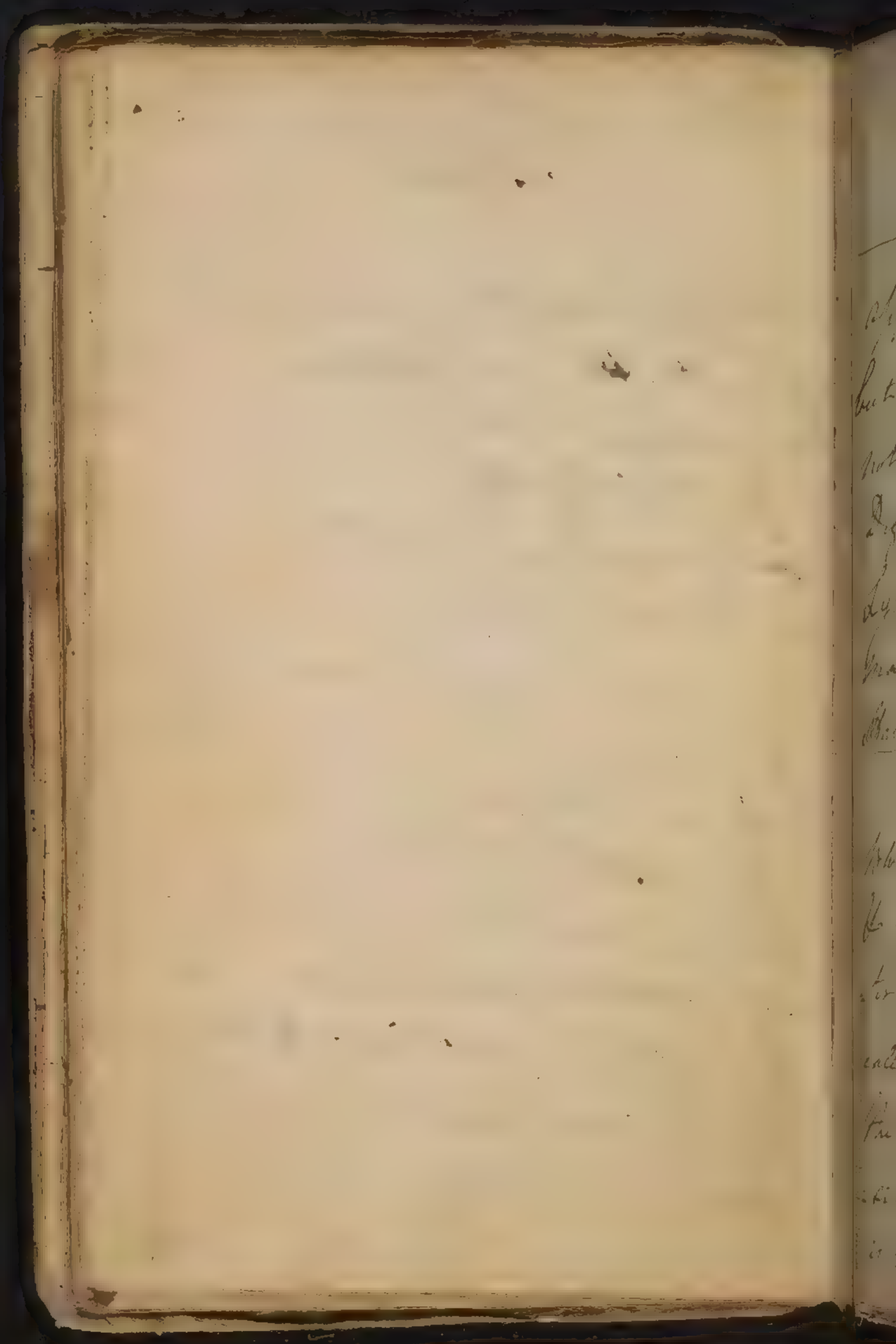


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## Blood

The Crassamentum is again divided into 2 parts. 1: <sup>red</sup> Globules, 2: a white tough gelatinous part called the buff. Coat. <sup>th</sup> It has long been supposed to be a morbid effusion in the blood. but it is constantly present, & may be demonstrated by pouring water on some blood laid on a cloth by <sup>th</sup> w: means all the red parts of the blood will be washed away, & the supposed morbid sily coat appears. Senac calls this part of the blood coagulable Lymph. I shall distinguish it only by <sup>th</sup> y: name of Lymph. The serum

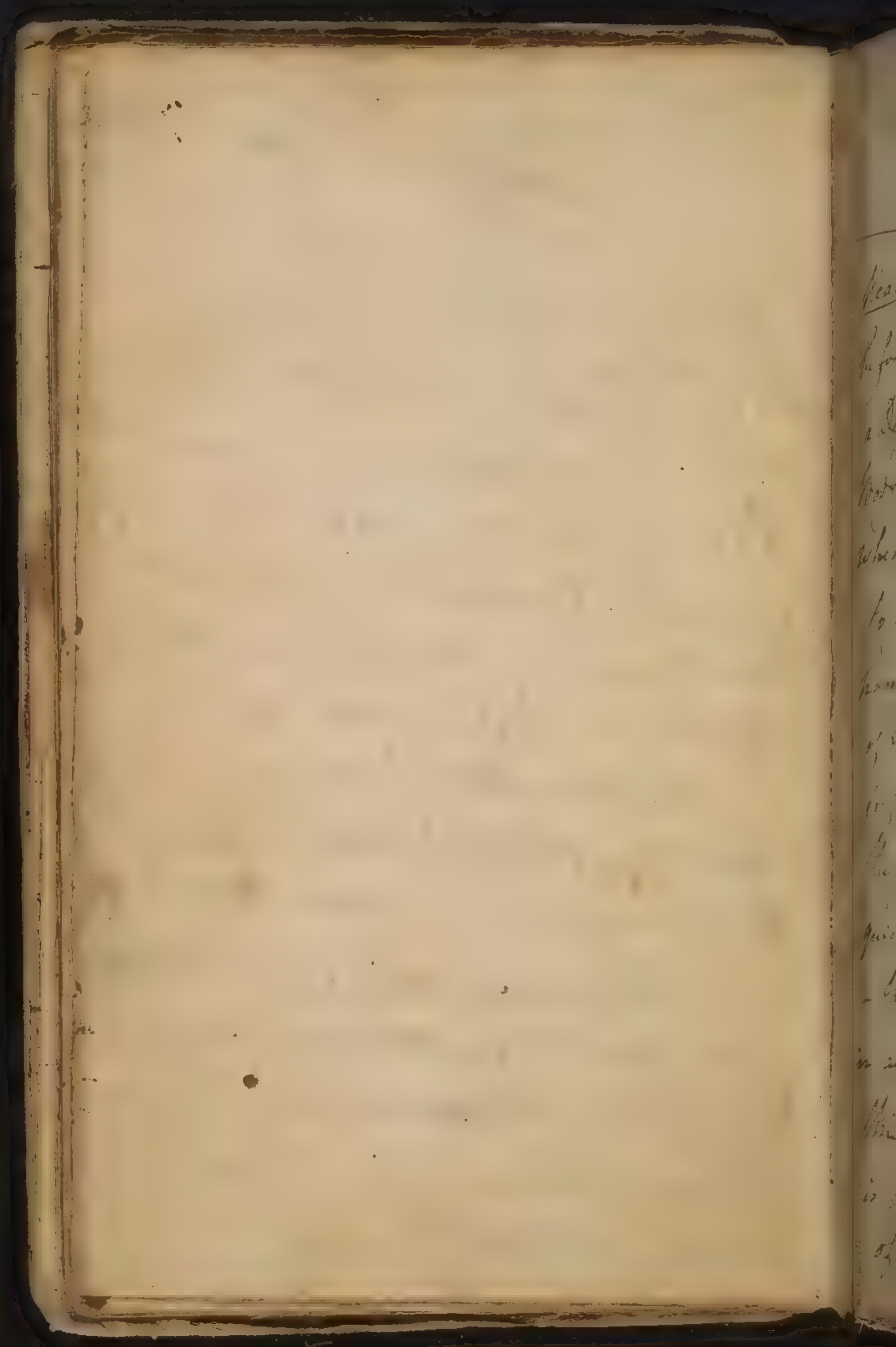




## Blood

appears to be Homogeneous,  
but Experiments teach us it is  
not. if we expose it to a certain  
Degree of Heat it coagulates like  
Lymph, & exhales a very volatile  
matter which exactly resembles the  
Calculus we before spoke of. -

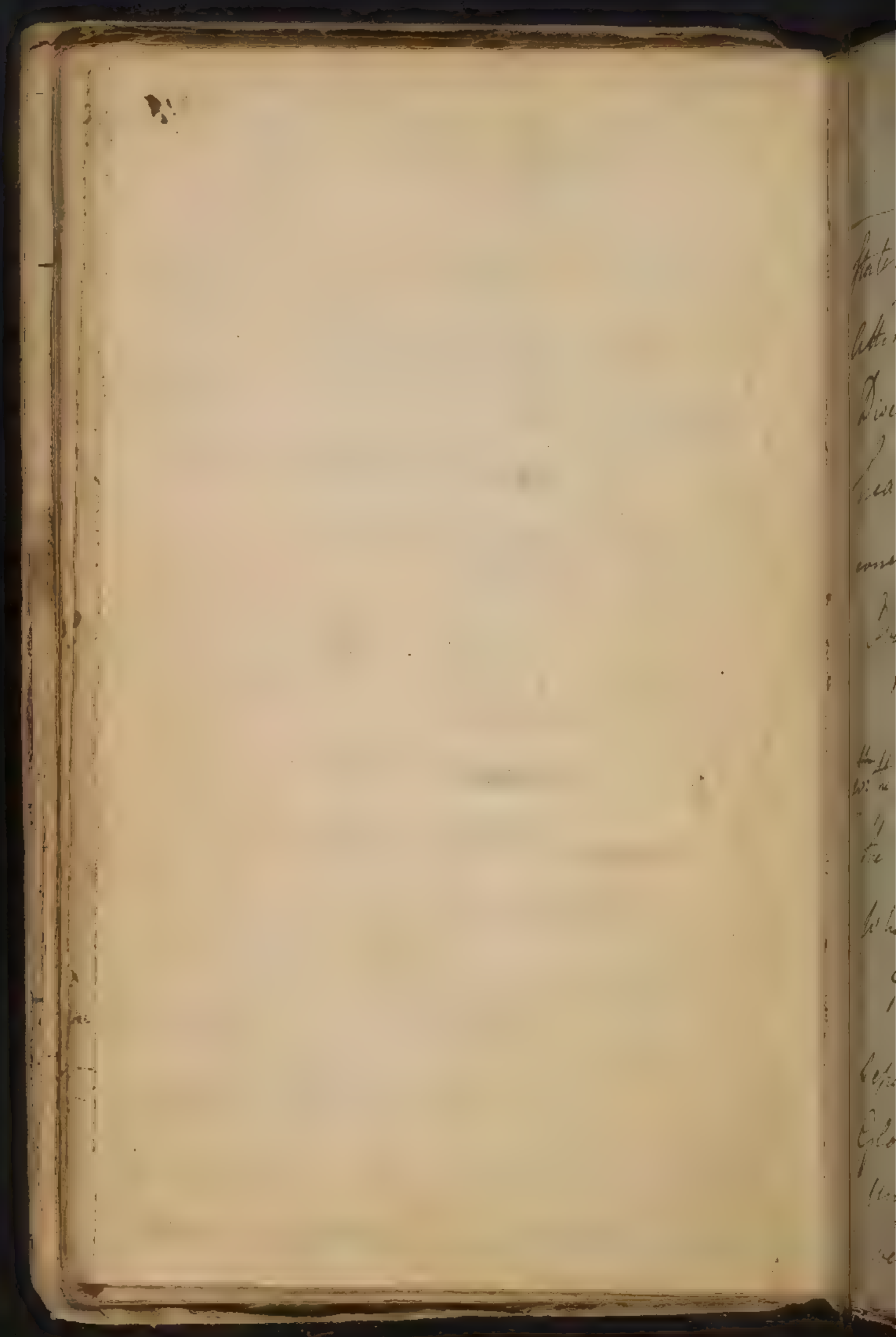
The Parts then <sup>2</sup> compose the  
Blood are 3. Red Globules - Lymph -  
the Serum, or w<sup>h</sup> I chuse to call by  
the name of Serous Liquor. I will  
call these the Constituent Parts of  
the Blood. Other matters may be occa-  
sionally there. By what means  
is the Blood kept Diffused? By





## Blood

Heat, hence we find the Separation we before spoke of never takes place in a Degree of Heat equal to  $\frac{1}{2}$  of  $\frac{1}{2}$  animal body. The Calities too, which exhalo when the Blood is drawn, may tend to keep the Blood in a more diffused homogeneous state. The Circumstances of Drawing Blood likewise considerably influence its appearance. The larger the Stream, & deeper the vessel, the quicker the Separation & vice versa. — This Experiment holds equally the same in all Inflam<sup>y</sup> Diseases. From all this you see how little Dependance is to be placed on the Appearance of the Blood in enquiring into the

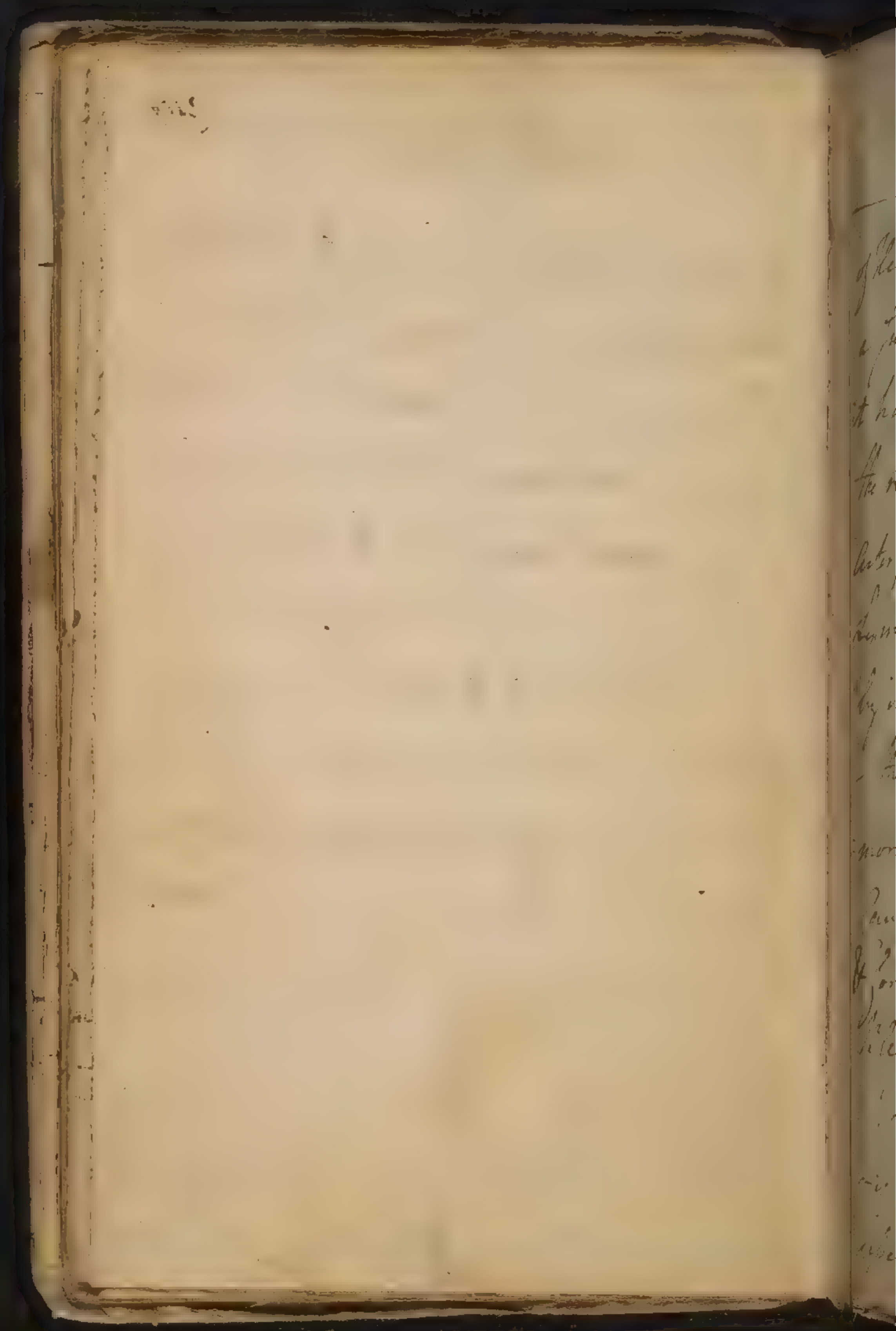




State of the Solids. formerly the only  
Attention was paid to the Blood, in  
Diseases, but from w<sup>h</sup> you have  
heard, you are I dare say fully  
convinced, how very fallacious such  
Observations must be.

The Red Globules are not mixed  
<sup>the</sup> w<sup>th</sup> the Lymph, but diffused only, hence  
the Readiness they show to separate  
when heat & moisture are withdrawn.

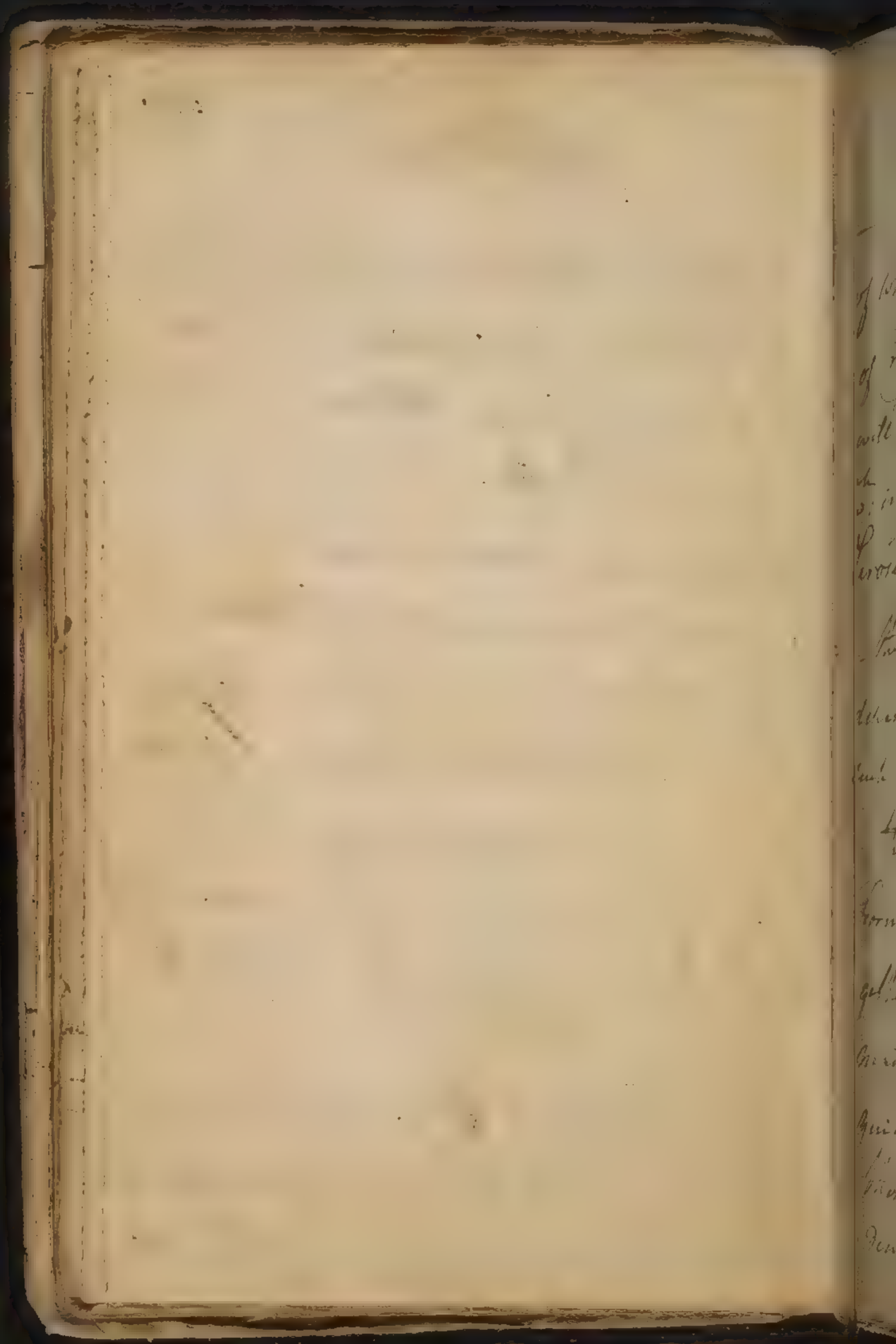
The Coagulable Lymph sometimes  
separates from the Serum & red  
Globules even in the Body when their  
Union is less firm than it should  
be, or when a sufficient Depre<sup>s</sup>





of Heat to keep them united, <sup>is wanting</sup> or when  
 a Substance is applied to it to which  
 it has a stronger Attraction than to  
 the red Globules. Hence we find if an  
 Artery is deprived of its Exudation the  
 Lymph is more strongly attracted  
 by it, & thus constitutes Polyphus.  
 The spontaneous stopping of He-  
 morrhages depends upon the same  
 Cause. viz: the Lymph coagulating  
 & forming a Thrombus round the  
 bleeding Artery.

The Serosity is of great Fluidity.  
 - is very volatile, & by its excretion  
 after Death favours the Coagulation.



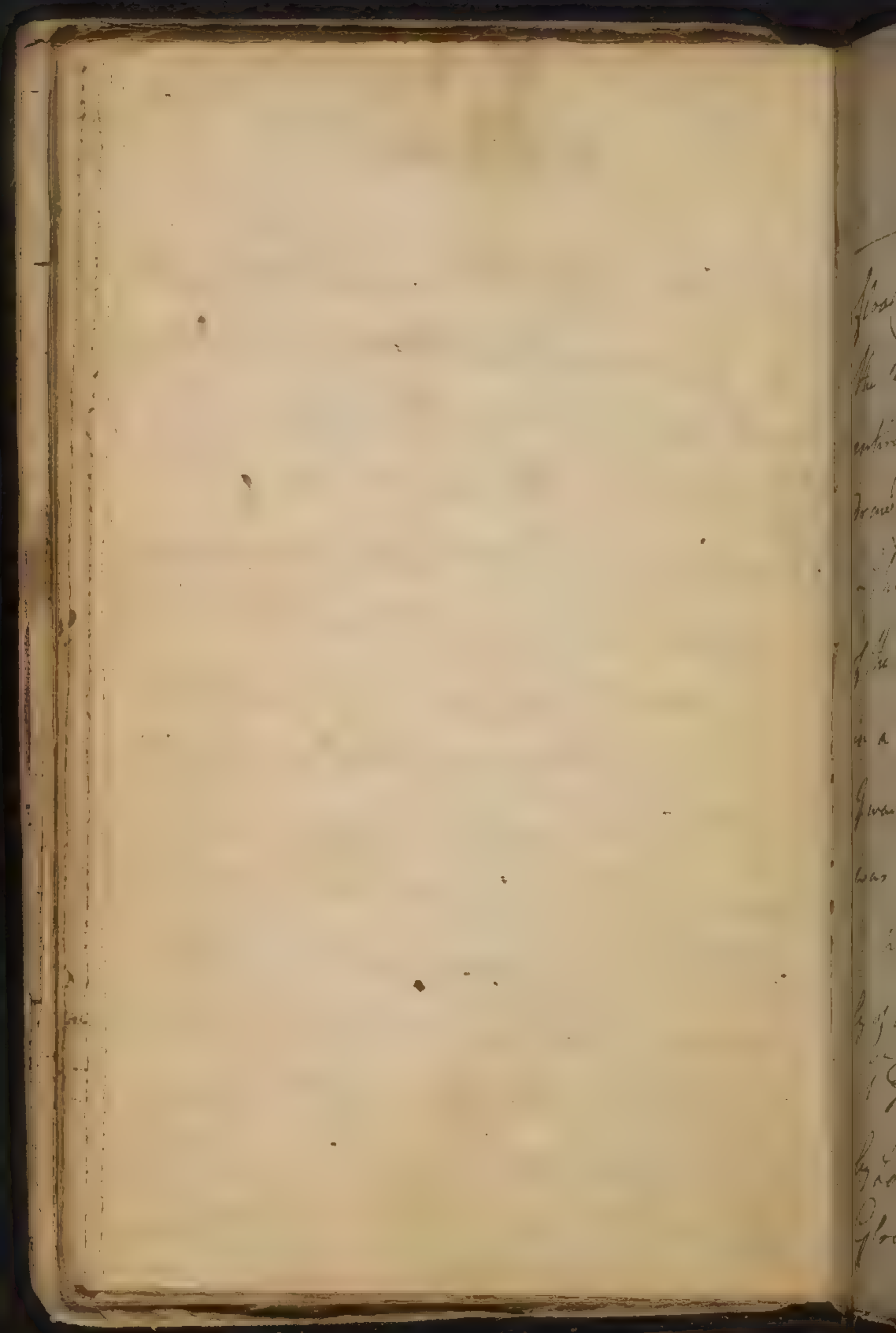


## of the Blood.

of what is left behind. Hence the quantity  
of Transudatum obtained in Bleeding &  
will depend upon those Circumstances  
<sup>wh</sup> influence the Separation of the  
Serosity, such as Heat, bread &c.

The Separation of the Lymph likewise  
depends upon several Circumstances,  
such as the Stream - the Degree of Heat -

the agitation it undergoes - the  
Form of the vessel in <sup>wh</sup> it falls - to-  
gether w<sup>th</sup> the Matter of w<sup>ch</sup> the vessel is  
made. The Separation is easiest and  
quickest in Earthen vessels. even in  
those Cases where the Lymph is  
dense, & formed into a little hollow



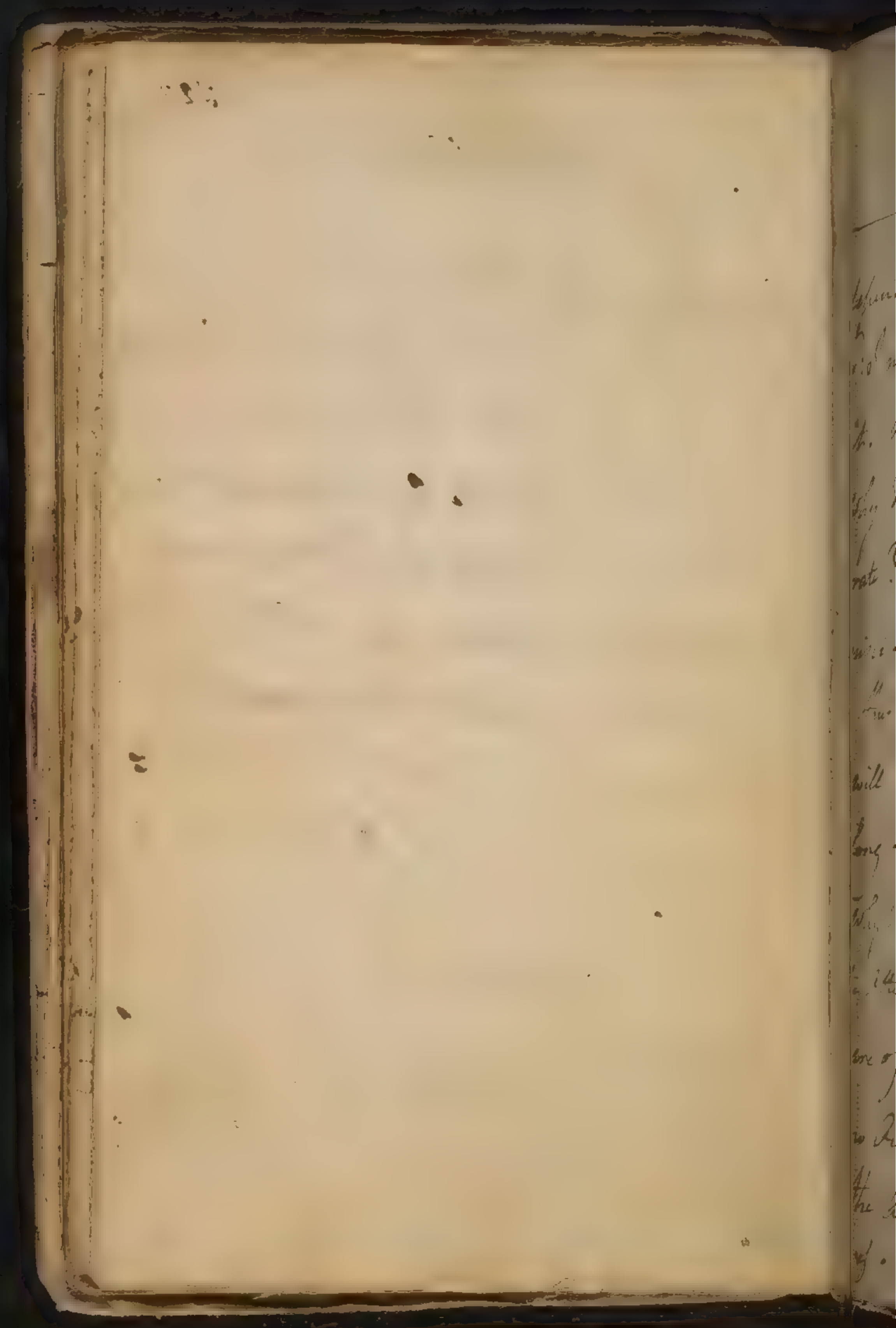


## of the Blood

floating Island, & where it threads over  
the whole vessel it is less dense it depends  
entirely upon the circumstances of  
drawing - cooling &c we before spoke of.  
- I have seen both these appearances  
of the blood within these few weeks  
in a Rheumatic patient whose blood  
I was sure would not be changed as it  
was drawn at such short intervals.

We shall now speak more particular-  
ly of each constituent part of <sup>a</sup> blood.

The Red Globules were supposed  
by Lowerhock to consist of Glass  
Globules on w<sup>h</sup> their Colour he imagined





## of the Blood

depended. This notion is so erroneous  
 that I need not take any time to refute  
 it. The <sup>1<sup>st</sup></sup> Question <sup>or</sup> Question <sup>that</sup> occurs here is  
 why do these Globules continue sepa-  
 -rate? Why because they are not  
 miscible w<sup>th</sup> any other parts of the blood.  
 - Thus we find Alcohol & Caustic Alkali  
 will never mix tho' agitated ever so  
 long. Some suppose the Reason  
 why the Red Globules do not mix w<sup>th</sup>  
 the other parts of the blood is because they  
 are of an oily nature. But surely  
 no Oil can prevent the mixing of  
 the Alkali & Alcohol we before spoke  
 of. To me they appear to be of an

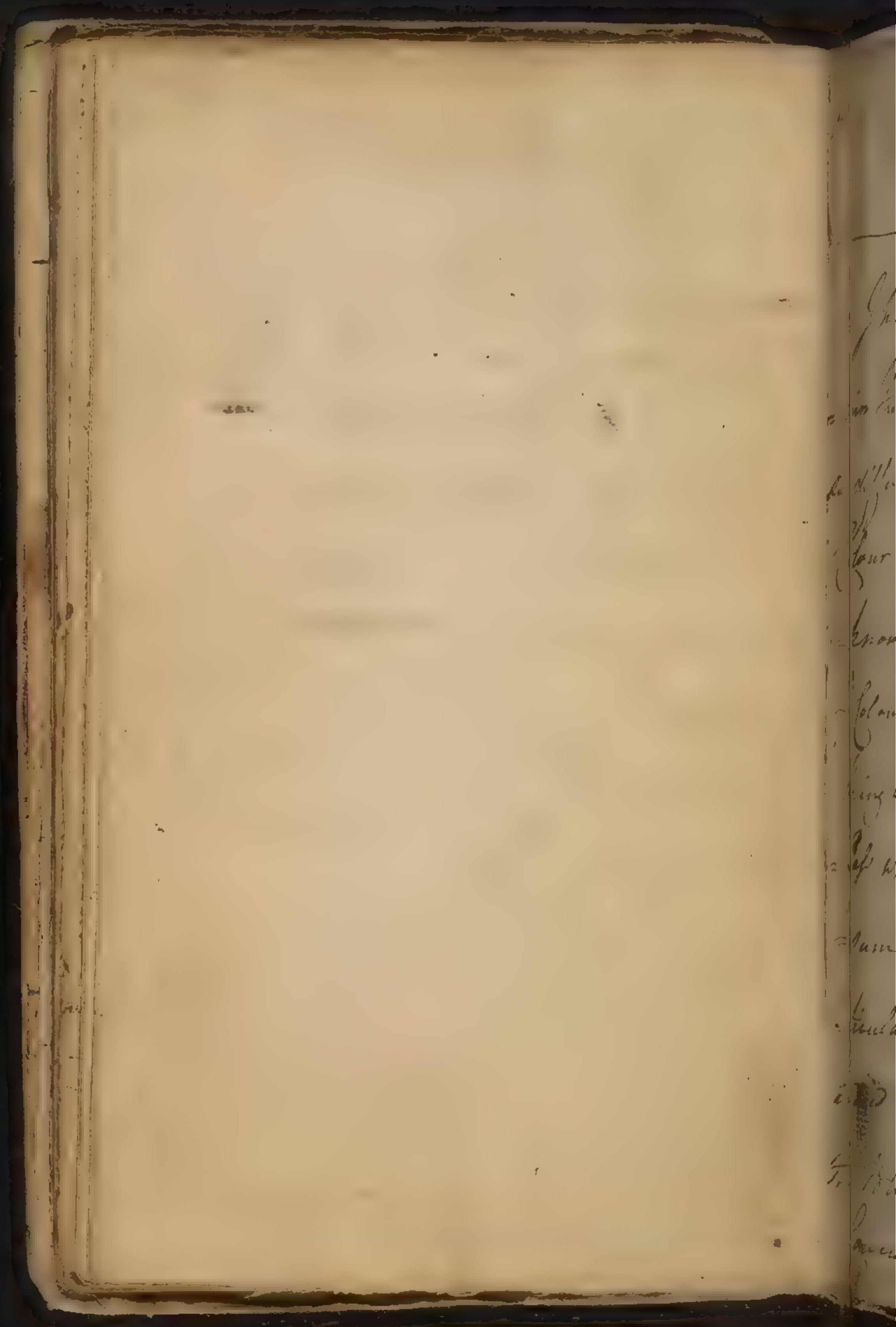
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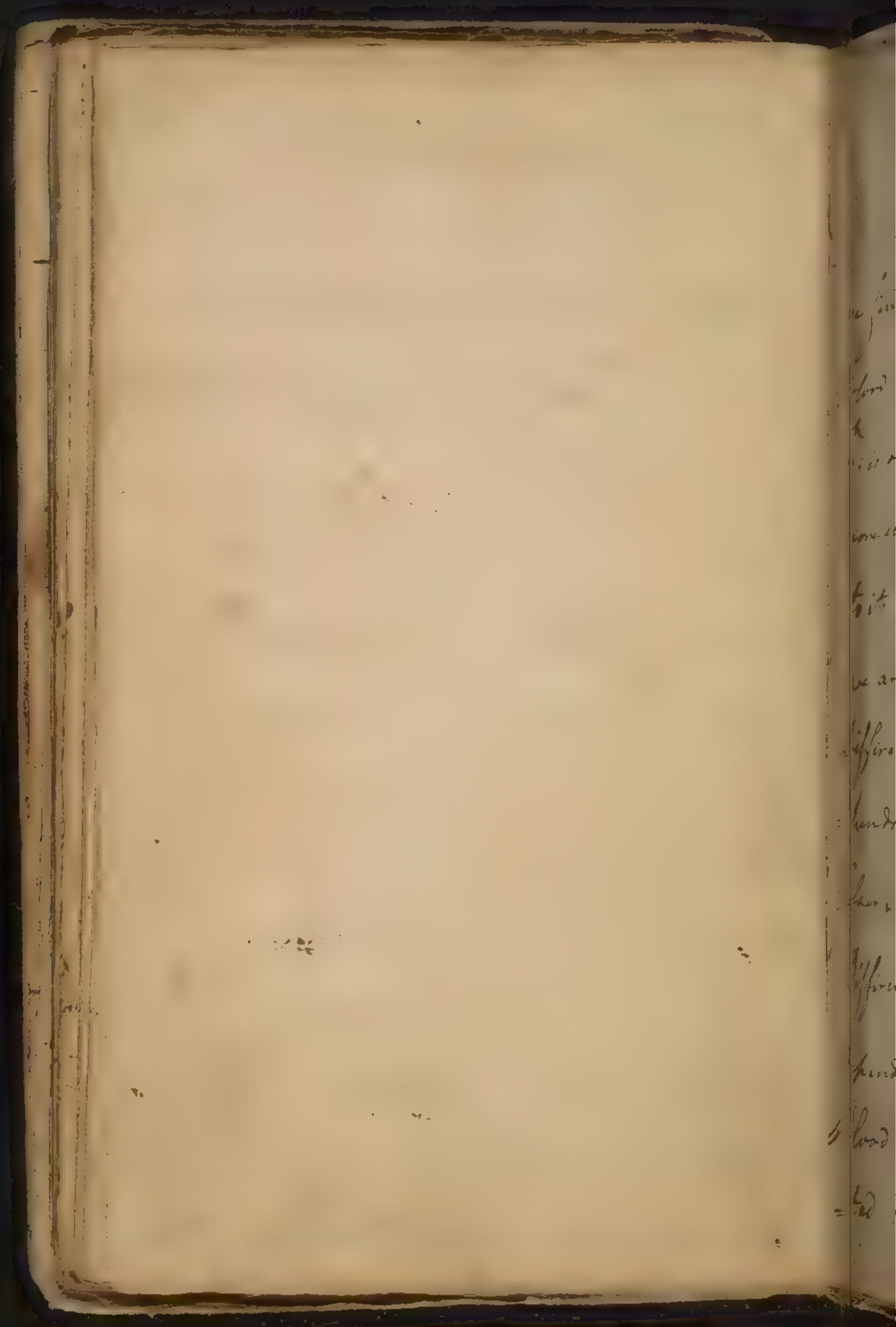
aqueous nature. This I infer from their  
 being so easily washed away from the  
 Lymph by water, <sup>thru</sup> from ~~thru~~ being  
 so diffusible in water. wait oil we can  
 cure these Phenomena w? never  
 take place. Nor do <sup>thru</sup> ~~it~~ Inflammable  
 Nature, nor yet their dissolving when  
 put over the fire prove them to be  
 oil, many things y? contain no oil  
 burn notwithstanding very readily &  
 are easily dissolved by fire. See 3478  
 & two following paragraphs of Dr Zaulin  
 Pathology upon this subject. What is  
 the specific Gravity of the red Globules?





## of the Blood

I know of no Experiments that ascer-  
tain this, as other parts of the Blood are  
so diffused with them. An <sup>r</sup> w: does their  
Colour depend? - This is as yet un-  
known to ~~us~~ us. Gr<sup>p</sup> ~~enat~~ imagines  
y<sup>r</sup> Colour depends upon 2 or 3 Globules  
being laid together each of w: <sup>ch</sup> are colour-  
less when separate. But here he af-  
-firms y: the Red Globules are cen-  
-tricular w: <sup>ch</sup> we cannot admit. I grant  
indeed the greater or lesser Colour of  
the Blood depends upon y<sup>r</sup> Degree of  
Concretion in the red Globules. Some





## of the Blood

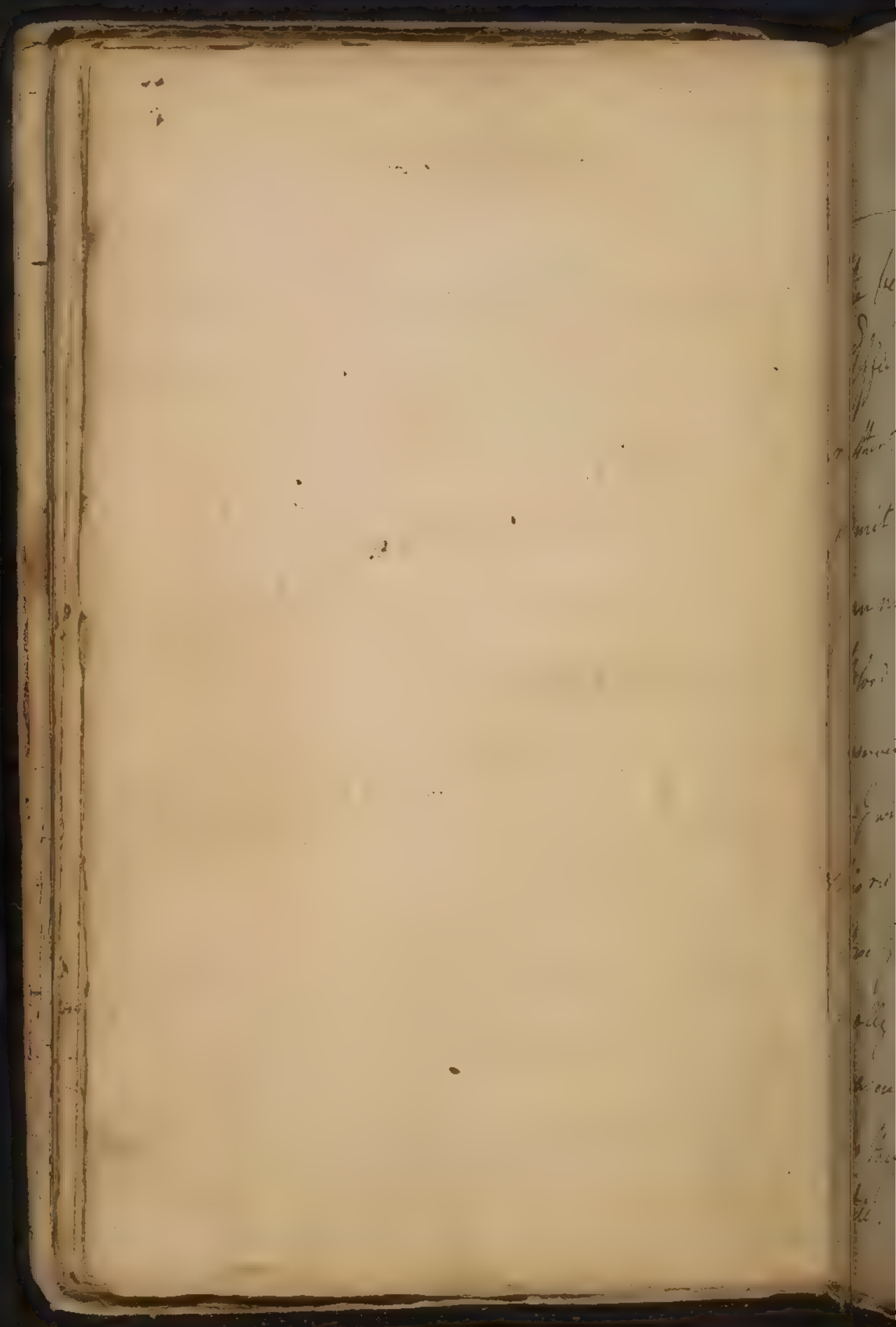
we find the Bottom of a Vessel of  
 Blood <sup>has</sup> the deepest blackish colour  
 which is owing to the Globules cohering  
 more closely. This was formerly attributed  
 to its not being in contact w<sup>th</sup> the Air, but  
 we are now sure this is not y<sup>e</sup> Cause. The  
 Difference of colour then in the blood de-  
 pends entirely upon the greater or  
 lesser Separation of Serum from it. The  
 Difference of colour in the Arteries & Veins  
 depends upon the same Cause. The  
 Blood in the Arteries is more agita-  
 ted & hence its more florid colour,

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## of the Blood

While the venous blood is less agitated & is moreover deprived of much of its thin serous parts, & hence arises its deeper black colour. This difference of colour has likewise been attributed to the action of the liver on the blood. But I think the solution we have given of it accounts for this difference of colour much better. But again, we know <sup>th</sup>at neutral salts w<sup>h</sup> thin & dissolve the blood encrease the florid colour, while Mineral acids coagulate it & press out the serous parts of the blood, & thus give it the deep black colour. even

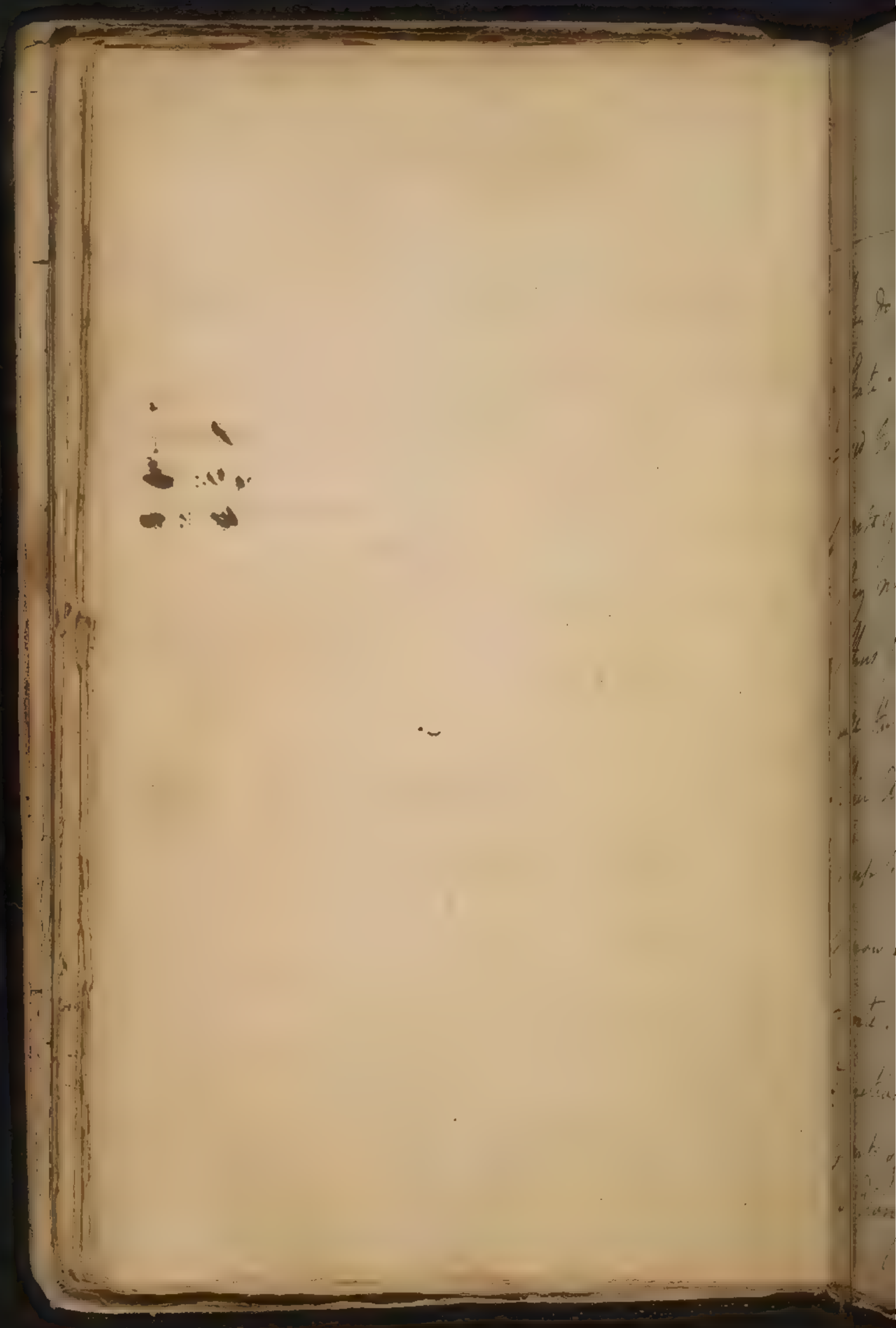




## of the Blood

The Vegetable Acid has these coagulating Effects altho' many suppose it tends rather to dissolve the Blood. Thus far we admit Mead's Opinion, but we cannot admit that diffusing the Blood deprives it of its Colour. D. Haller deserved to be consulted on this Subject.

- I wish I could inform you from whence this red Colour is derived, & in w: manner these Globules are formed. They are generally proportioned to the Action of the vascular System. in w: manner do they pass away? This we cannot tell. we are sure in a healthy Body





228  
of the Blood

They do not pass away in their natural  
state. They appear to be more dis-  
posed to Putrefaction than any ~~other~~ <sup>other</sup>  
parts of the Blood, & when putrefied  
they may mix w<sup>th</sup> the Serum, and  
thus pass out of the System? but  
all this is only conjectural. What is  
their Use in the Body? Perhaps to  
keep the Lymph diffused which we  
know is very much disposed to con-  
crete. They may likewise assist in  
the function in retaining the soft fluid  
parts of the Blood. Further the growth  
& elongation of the System may

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## of the Blood.

depend upon their action especially  
as we find them confined only to the  
blood vessels.

2: <sup>nd</sup> Coagulable Lymph. It is not  
easy to take this portion of our fluids  
by itself. it generally contains a  
Quantity of Serum. hence our Experiments  
<sup>must</sup> upon it be uncertain. however we  
have a fluid analogous to it on w:  
man's Experiments have been made  
viz: the Albumen Ovi. ~~however~~ both  
these fluids are coagulable by 150:  
of Heat - both by acids & alkalis in  
like Quantities & in like Manner. They

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## of the Blood

Only differ in <sup>3<sup>rd</sup></sup> 1<sup>st</sup> The Albumen Bri is more bland than <sup>2<sup>nd</sup></sup> Lymph <sup>ch</sup> w: is owing to the latter containing some saline parts of the Serum. 2<sup>nd</sup> The Albumen Bri never concretes in the Cold <sup>ch</sup> w: is ~~owing~~ owing to its containing a greater quantity of water mixed with it. - if Albumen Bri is dried & afterwards mixed w: water in the heat of the body it is diffused, but in the Cold it concretes like coagulable Lymph. Upon the whole then I think they are exactly the same. They are both of them the Source of nourishment. all vegetable.

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## of the Blood

matters are first formed into Lymph, <sup>ch</sup> w:  
 after a while is dissolved in the water we  
 take into our Bodies, & is then called  
 3<sup>d</sup>. Urosity. This appears to be nothing  
 but water w: Salt dissolved in it. This  
 Salt <sup>ch</sup> w: it contains is of  $\frac{1}{2}$  Ammoniac:  
 :al kind, the alkali of w: is  $\frac{1}{2}$  <sup>ch</sup>  $\frac{1}{2}$  same  
<sup>ch</sup> w: all other Volatile Alkalies, but its  
 acid is of a peculiar nature, and has  
 been called the acid of Urine, or the  
 Acid of Phosphorus. But how is this  
 acid formed, & what is its use in  $\frac{1}{2}$  <sup>ch</sup>  
 Animal Economy? & ~~how~~ does it  
 arise from a Degeneracy of our Food?

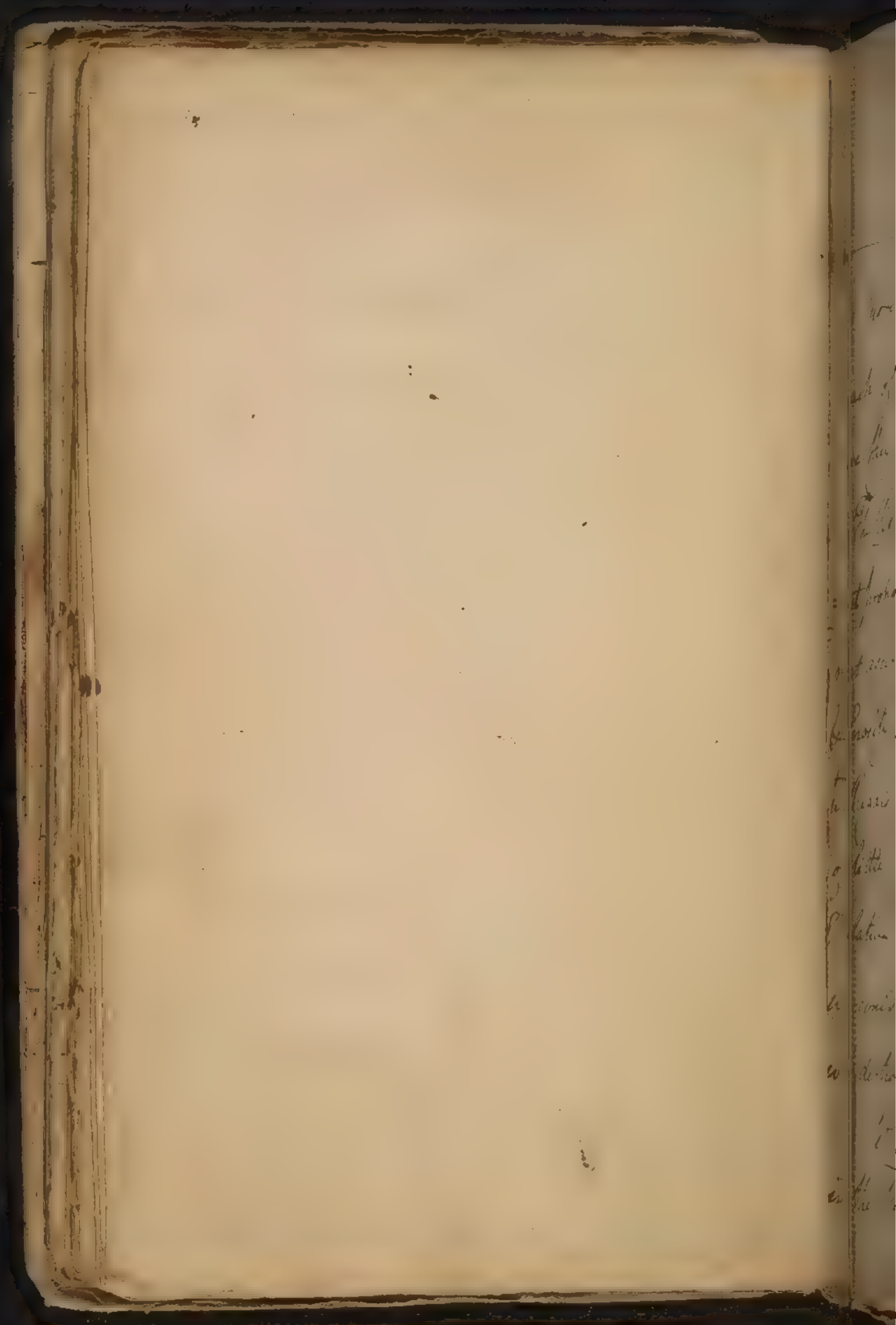
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## of the Blood

all these are questions we cannot pretend to answer. I am apt to think it is not a morbid Phenomenon. I imagine it may tend to dissolve the Lymph so as to form the Loxity, as also to keep the whole Mass of Blood in a fluid dissolved State.

One Question arises here & that is <sup>is</sup> what is the Proportion <sup>in</sup> each of these parts of the Blood bear to one another? - many have attempted to explain this Question but I think w<sup>th</sup> little Success. It differs in different Constitutions & in different States of the Body. It





## of the Blood

is moreover very difficult to procure  
each of them in a separate state so apt  
are they to be diffused w<sup>th</sup> each Other. See

The Red Globules appear to be in y<sup>e</sup> small-  
est proportion. I know of no Experiments  
that ascertain the proportion of y<sup>e</sup> Lymph  
& Serosity. The Lymph is in a large Proportion.  
w<sup>th</sup> regard to the Red Globules. it would be  
of little consequence to us if we knew their  
Relative Proportions to each Other, as  
we could not tell when this Proportion  
was destroyed in Diseases.

What Other Matters are contained  
in the Blood? Some suppose the

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Hand 2

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2. *Chelone*

100

2. *Red*



## of the blood

Chyle ought to be considered as a part of  
the blood. But the evidences of Presence  
of this Chyle in the blood are not satisfac-  
tory. The Notion of its prevailing in the  
blood arose entirely from an Ignorance of  
the Nature of the blood. Coagulable Lymph  
has I believe been mistook for it. I will  
still however allow that Chyle may be pre-  
sent in our blood altho' it is not observed by our  
Lenses. But of this we shall speak more  
hereafter when we treat on <sup>2</sup> Milk.

Our Fluids <sup>ch</sup> circulate in the blood;  
: vessels may be divided in 5. parts

1<sup>st</sup> Aliment not quite assimilated

2 Albumen, or coagulable Lymph.

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## of the Blood

3 Albumen tending towards Serosity.

1<sup>st</sup> Serosity, strictly so called.

5 Red Globules.

To these 5 parts Dr. Linae adds 2 more. viz  
a Gelatinous & Mucous Part. But I know  
of no Experiments that show us any  
thing like a gelatinous matter in the blood.  
I therefore conclude he infers its Existence  
only from Theory, viz: <sup>From</sup> the Nature of the  
<sup>ch</sup> Solids w: are gelatinous when resolved, &  
<sup>ch</sup> w: are formed from the blood. Besides  
even the gelatinous matter of our  
Solids is proved only by a decomposition  
of their constituent parts, & does

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of the Blood

not appear to have prevailed in the Solids. There appears to be more Foundation for the Mercurity he talks of, especially when we see how much it abounds in <sup>the</sup> System, - But notwithstanding we have no Experiments that prove its Existence in the Blood. It appears to be the ~~product~~ entirely of Secretion. Dr. Haller endeavours to support this Opinion by saying that we take a large Quantity of Mercur in <sup>the</sup> our Aliment. but this proves nothing. for it must certainly undergo the common Assimilation of all other Aliment. Dr. Senac makes use of another Argument to confirm his Supposition. That is,

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## of the Blood

If you press the Stomach of <sup>a</sup> dead Animal  
you may squeeze out more Mucus  
from it <sup>2</sup> can be supposed to be con-  
tained in its Follicles. But 2 Objections  
may be made by: <sup>1</sup>st. 1: we cannot pre-  
tend to ascertain the exact Size or Capacity  
of the Follicles of the Stomach & 2<sup>nd</sup> Suppo-  
sing it pressed out in ever so great a Quantity  
it never could have existed in <sup>the</sup> <sup>1</sup>st state  
in the Blood, for all Secreted Matters are  
remarkably thin when first poured into  
their several Glands, & have scarce any  
Resemblance to <sup>the</sup> <sup>1</sup>st or even in <sup>the</sup> <sup>2</sup>nd they appear  
after stagnating a while.

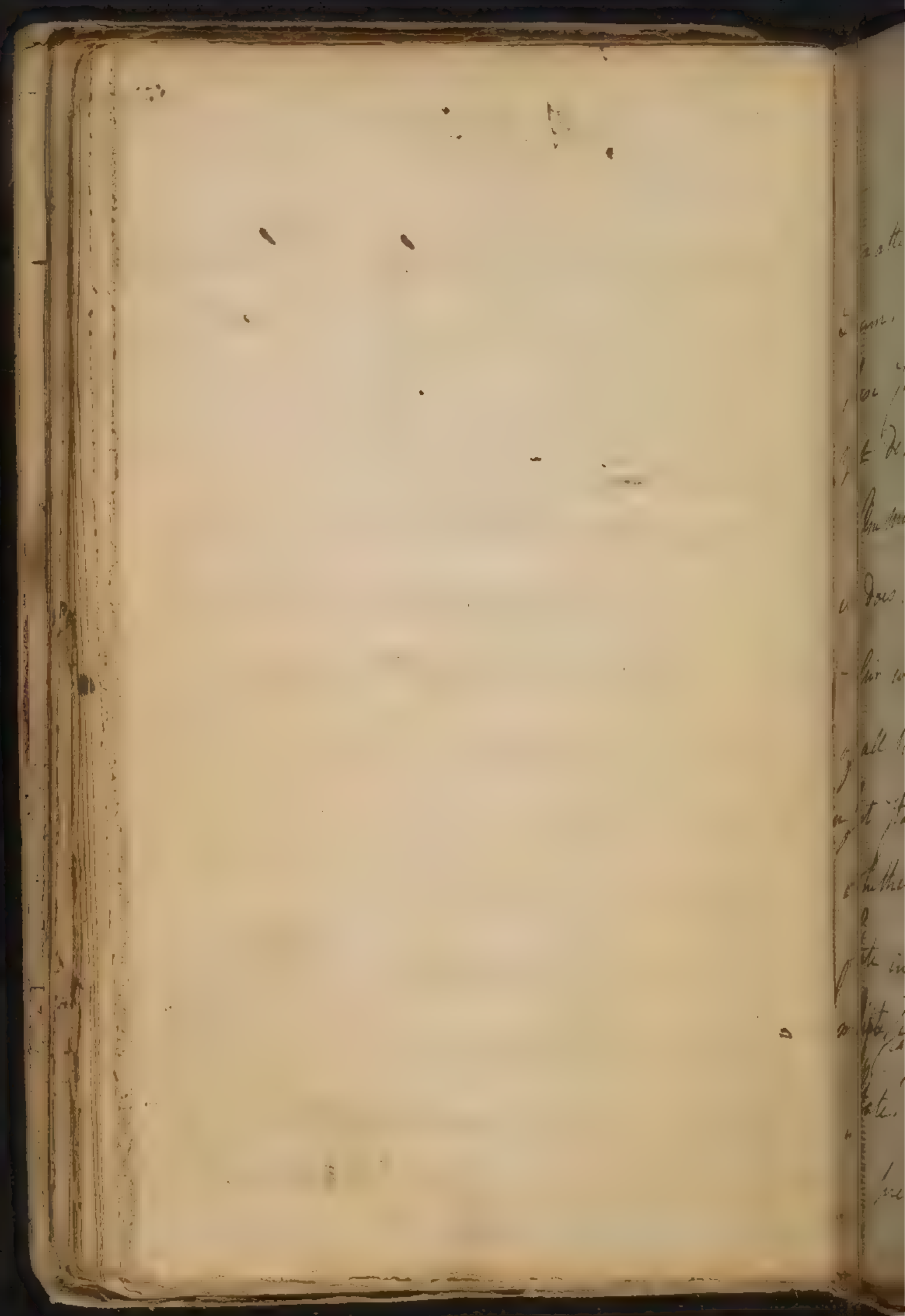
But what shall we say to the

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Presence of Oil in the Blood? we certainly  
take a great deal of it into our Aliment,  
I know of nothing in the Fluids of our  
body that ~~can~~<sup>is</sup> capable of mixing it with  
the blood. But still we have no proof  
of its existing formally in the Mass of  
Blood. The Facts Dr. Haller adduces in  
Support of his Opinion are very few & are  
not well attested. For my part I have  
never seen any thing in the Blood  
had the least Resemblance to oily Matter.

I grant there is a variety of saline  
Matter present occasionally in the  
Blood from Medicines & other things  
taken into the Body. These saline

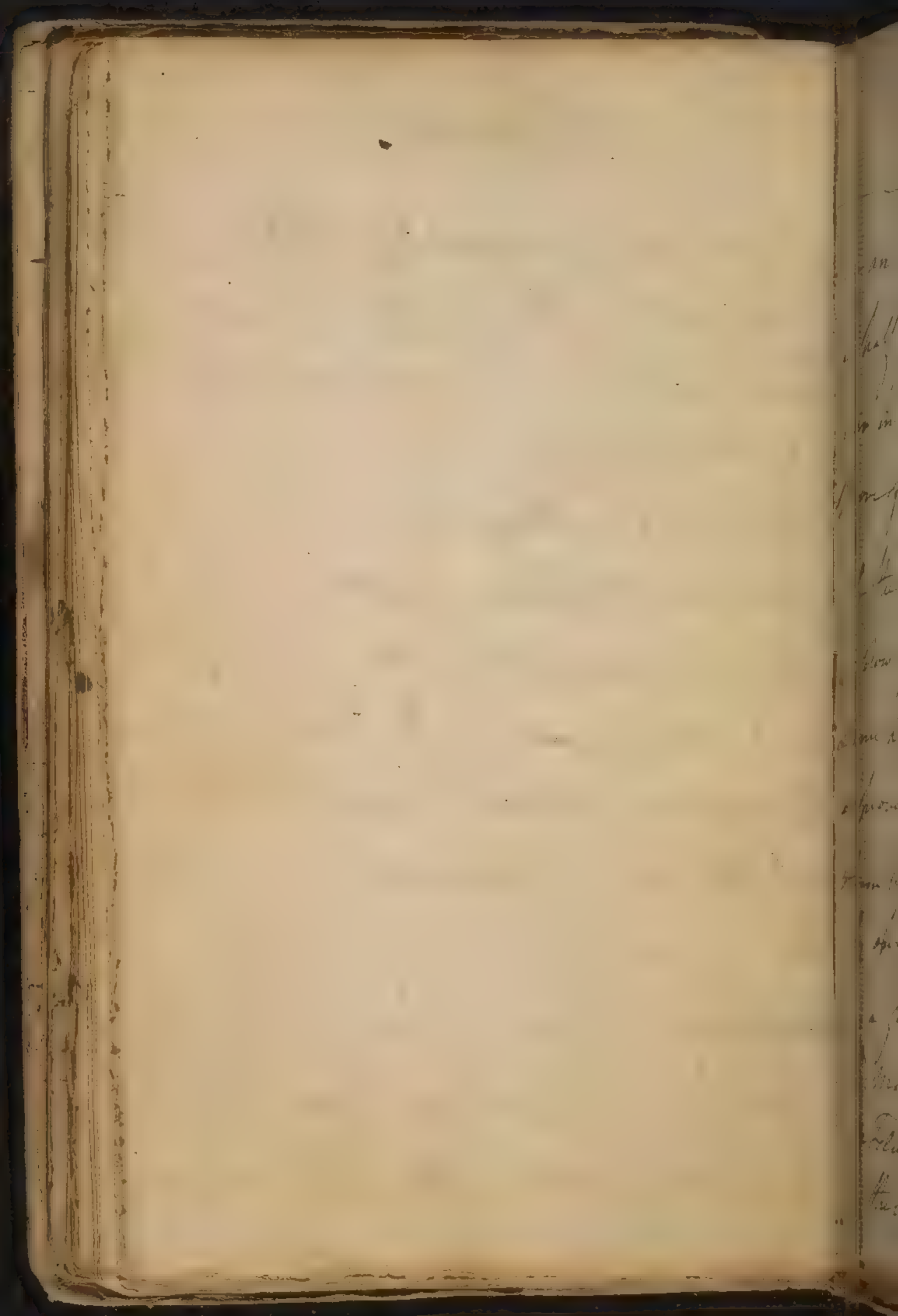




Matters are Ordinarily dissolved in <sup>2</sup> Serum, but w<sup>th</sup> the specific nature of these facts is no Experiments have yet determined.

One more Question occurs here, & that is, does our Blood contain Air?

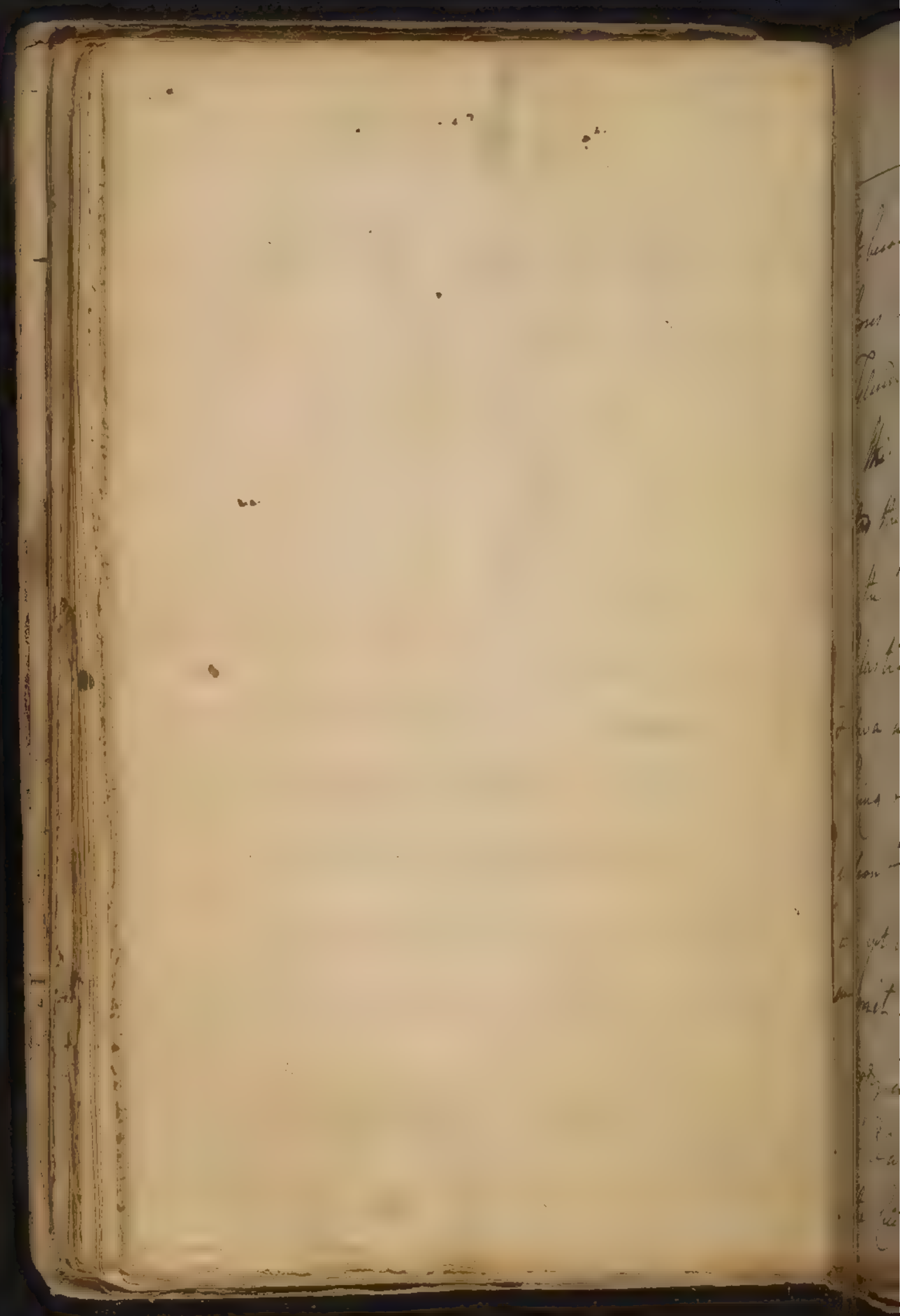
Air we know enters into <sup>2</sup> Composition of all Bodies, and is then said to be in a fixed state. But our Inquiry here is whether Air is present in an Elastic state in our Fluids, or in an intermediate state between a fixed & Elastic state? - I think we have Reason to presume it is often present in





## of the Blood

in an Elastic state, but always in a half fixed state. Water contains Air in a semi-Elastic state. This we know from taking off the pressure of the Atmosphere in an Air pump. Now I imagine it is present in the same Degree in Animal Fluids. This is proved from the Air extricated from them by Putrefaction. It is taken in by our Aliment in great Quantities in a fixed state. We cannot tell in what manner the Air escapes from the Fluids. May <sup>it</sup> not be from the Lungs? — The Air in the Chyle is of most Elastic.





241  
of the Blood.

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It becomes less so in the Blood, but  
loses all its Elasticity in <sup>some of</sup> the secreted  
Fluids more especially in the Urine.  
This would make us believe that ~~as~~  
~~the~~ the Air was losing its Elasticity  
in the Blood. But we find it in an  
Elastic state in the Milk, Bile - and  
Saliva which may seem to favour its  
being rendered Elastic by the Lysium.  
Upon the whole, the Subject is dark, &  
as yet we can say nothing precise  
upon it. There is one part of the  
Body <sup>in</sup> which seems to contain Air in  
an Elastic state naturally, viz  
the cellular membrane. This is proved

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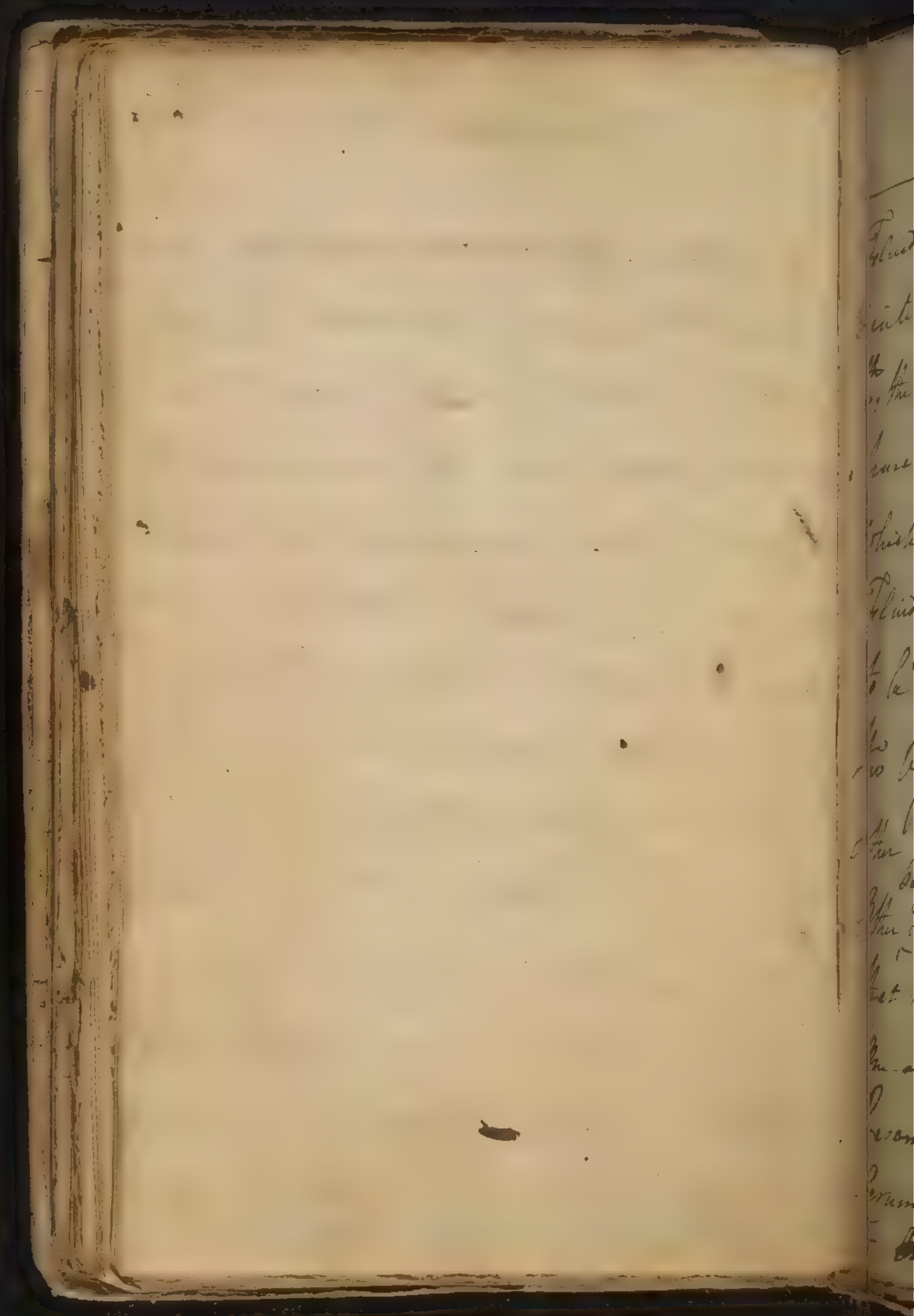


from Emphysema's. M<sup>r</sup> Senac says  
 air is to be found in every cellular  
 membrane in the body. I think it  
 appears to be highly<sup>+</sup> probable that  
 there is a secretion of this air from  
 our ~~solid~~ <sup>oh</sup> fluids: it is poured out in the  
 cellular membrane, & that many  
 Diseases not yet described may arise  
 from a Separation or a want of a  
 due secretion of air. This then finishes  
 our acc<sup>t</sup> of the blood, or circulating  
 fluids. all the other fluids of  
 body are formed from them by organs  
 provided for that purpose. This function

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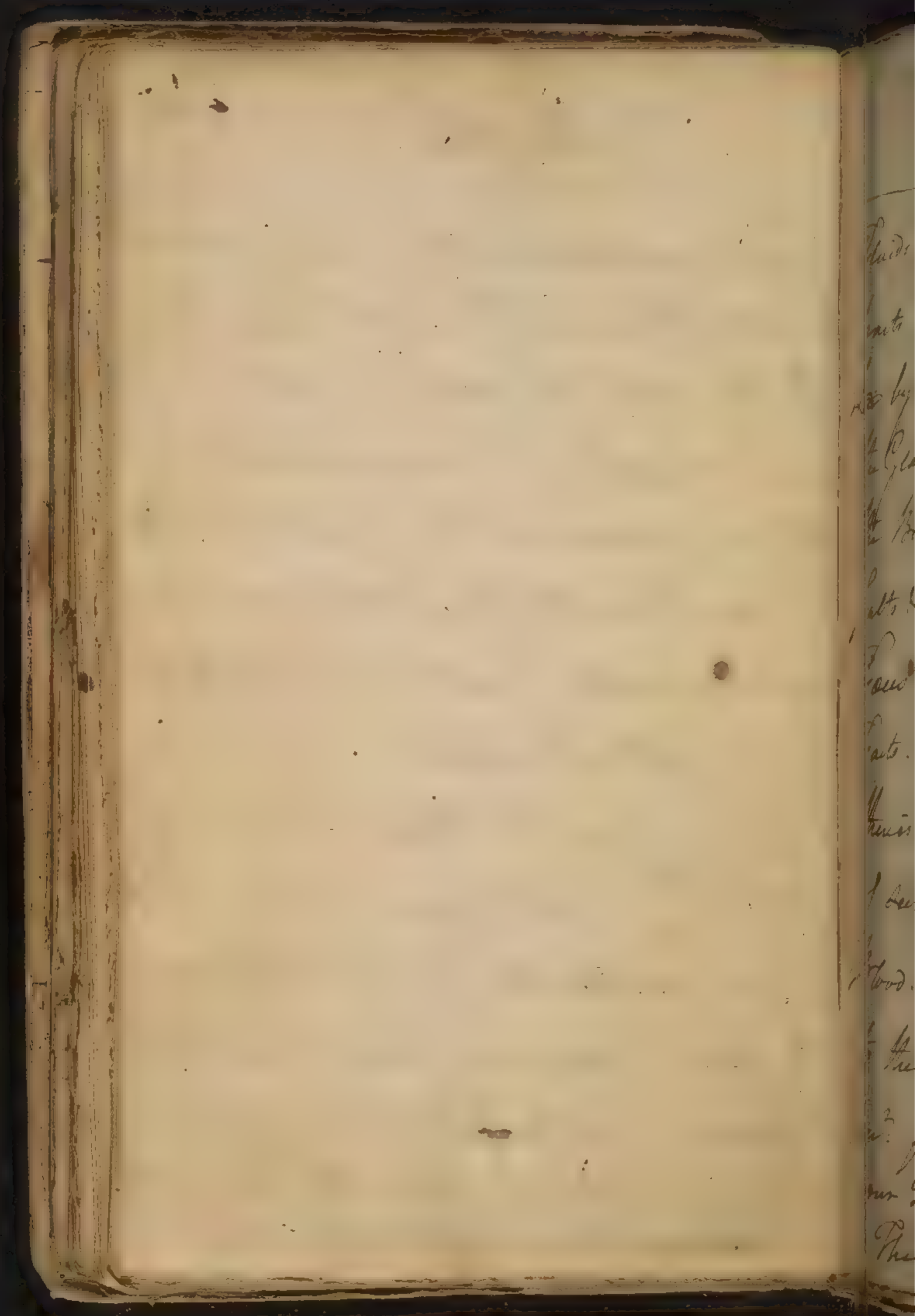


is called Secretion which appears to be the most considerable function of the Animal Economy, and I am sorry to add One that we understand least about. By Secretion we understand Fluids prepared from a heterogeneous mass of Fluids by a kind of Colation. — a Question occurs here in the first place & i.e. did the secreted Fluid preexist before in the blood? or are they formed by a new mixture? as to the first of these we have sufficiently rejected it when considering the constituent parts of the blood. thus far we may allow it to be true, that the





Fluids we exhale from every external  
& internal part of the body, together  
w<sup>th</sup> the Urine & Sweat appear to be  
pure Serosity. we have several Sep<sup>ts</sup>  
which establish this Relation. These  
Fluids then strictly speaking are said  
to be secreted, that is they pass off  
two vessels w<sup>ch</sup> refuse a passage to  
other parts of the Blood! But no  
other Fluids of the body have anything  
that resemble them in the Blood. No  
One can have any Suspicion of the  
Presence of Bile <sup>in</sup> the Blood or of the  
Seramen Mucium before they are secreted.  
- ~~Other~~ Some suppose y<sup>e</sup> secreted





*Secretion*

245

Fluids exist in the Blood in those parts <sup>wh</sup> constitute them ~~and the~~ ~~are~~ by mixture when they arrived at the Glands. Thus Dr Boerhaave makes the Bile to consist of bil. alkaline & salts ~~be~~ absorbed from <sup>&</sup> Amacetum & Lues. But this is contradicted by many Facts. Upon the whole I conclude there is no Foundation for <sup>&</sup> Opinion of secreted Fluids preexisting in the Blood. We must then look ~~for~~ to the Organization of the Glands to see? for Secretion. We must reduce our Fluids to 2 kinds; Bil. & Watery. The watery parts of our Fluids may

(a) This is remarkable in  $\frac{1}{2}$  Blood  
in an Ischaemia Renalis, in w<sup>ch</sup>  
Disease even  $\frac{1}{2}$  pores have poured  
out Urine.



## Secretion

be divided into 1<sup>st</sup> Lymph 2<sup>nd</sup> Mucus  
3<sup>rd</sup> such as are impregnated w<sup>th</sup> saline  
matter viz: Urine & Perspiration.

The Bily matters are more difficultly divided.  
— Perhaps the Milk may arise from it.

— But I cannot conceive of Bile or of  
Crumen Aurium arising from ~~two~~ it.

we must then resolve their Formation  
to the Nature of the Secreting Organs.

we have no Observations y<sup>t</sup> show us the  
Presence of Bile in the Blood in an  
Obstruction of the Secreton from  
Spissority - or Inflammation. we  
must then allow that it is formed  
in y<sup>e</sup> secretory Organ itself. we see

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## Secretion

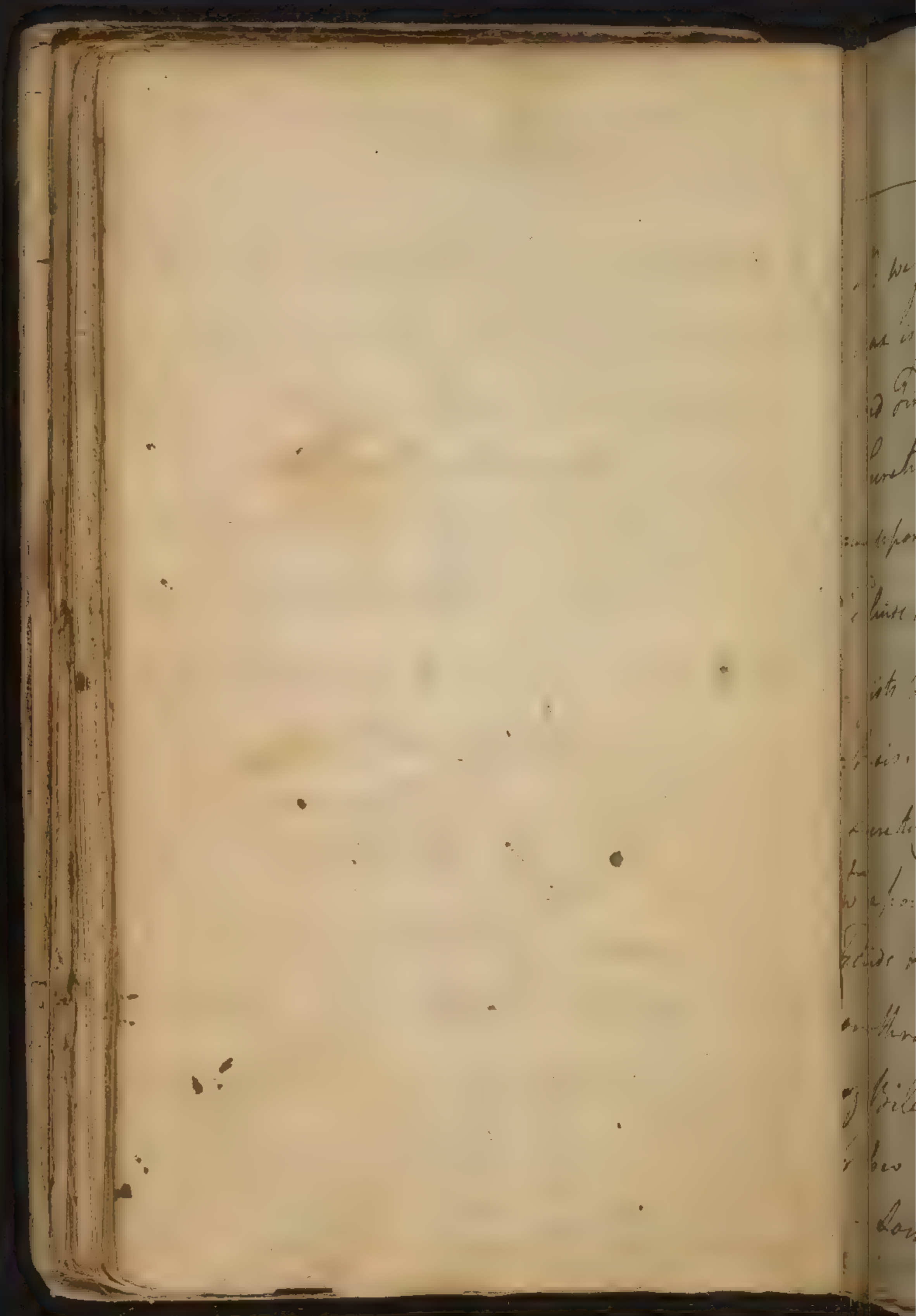
Something analogous to this in Plants  
<sup>ca</sup> from the general Fluid are capable  
 of secreting 4 or 5 different Juices. <sup>h</sup>W:  
 is the nature of the Secretory Organs  
<sup>2</sup>y: gives them the power of forming  
 such Fluids? - This is a most difficult  
 Question. Some of the Glands consist of  
 a Series of decreasing vessels. Others have  
 Follicles interposed between <sup>e</sup>y & excretory  
 & excretory vessels. But we must attend  
 to the first Structure Only in accounting  
 for Secretion, for the Fluids are always  
 secreted before they are poured into  
 the Follicles. Shall we call in <sup>2</sup>y:  
 Difference of Structure to ~~be~~ <sup>indure-</sup>  
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## Secretion

refers to an<sup>d</sup> for Secretion. hence the  
 Reason why the Secretions in Children  
 are different from w<sup>h</sup> they are when they  
 grow up. But 2<sup>d</sup> we find the Secretions  
 altered by Affections of the Nervous System  
 which tend either to contract or enlarge  
 the Apertures of the Glands. This is  
 evident in the limpid pale Urine which  
 follows a Spasm on y<sup>e</sup> Kidneys in an  
 Hysteria. 3<sup>d</sup> we find the Secretion chan-  
 ged by increasing y<sup>e</sup> Intake of y<sup>e</sup> Blood  
 whereby proper Matter has more  
 Glands than ordinarily do. such as  
 red Globules w<sup>h</sup> furnish a strong  
 Argument in favour of Secretion de-  
 pending on y<sup>e</sup> Diffuseness of Apertures.





## Secretion

1<sup>st</sup> we find in Cases of Injections the  
 wax is often injected without the  
 red Tincture <sup>wh</sup> shows us a kind of  
 Secretion. But all these Arguments pro-  
 ceed upon a Supposition of <sup>2</sup> secretory  
 Solids preexisting in the Blood. Physiolo-  
 gists have therefore called in Other Hypo-  
 thesis. Winslow supposes <sup>2</sup> the  
 secretory vessels are originally endowed  
 with a power of admitting one sort of  
 Solids & repelling Others, but this is  
 overthrown by <sup>2</sup> we see in <sup>1</sup> Case  
 of Bile <sup>wh</sup> when diffused in <sup>1</sup> Blood  
 passes thro' <sup>1</sup> Kidney, Salivary Glands &c.  
 - Some Other powers of Mixture &

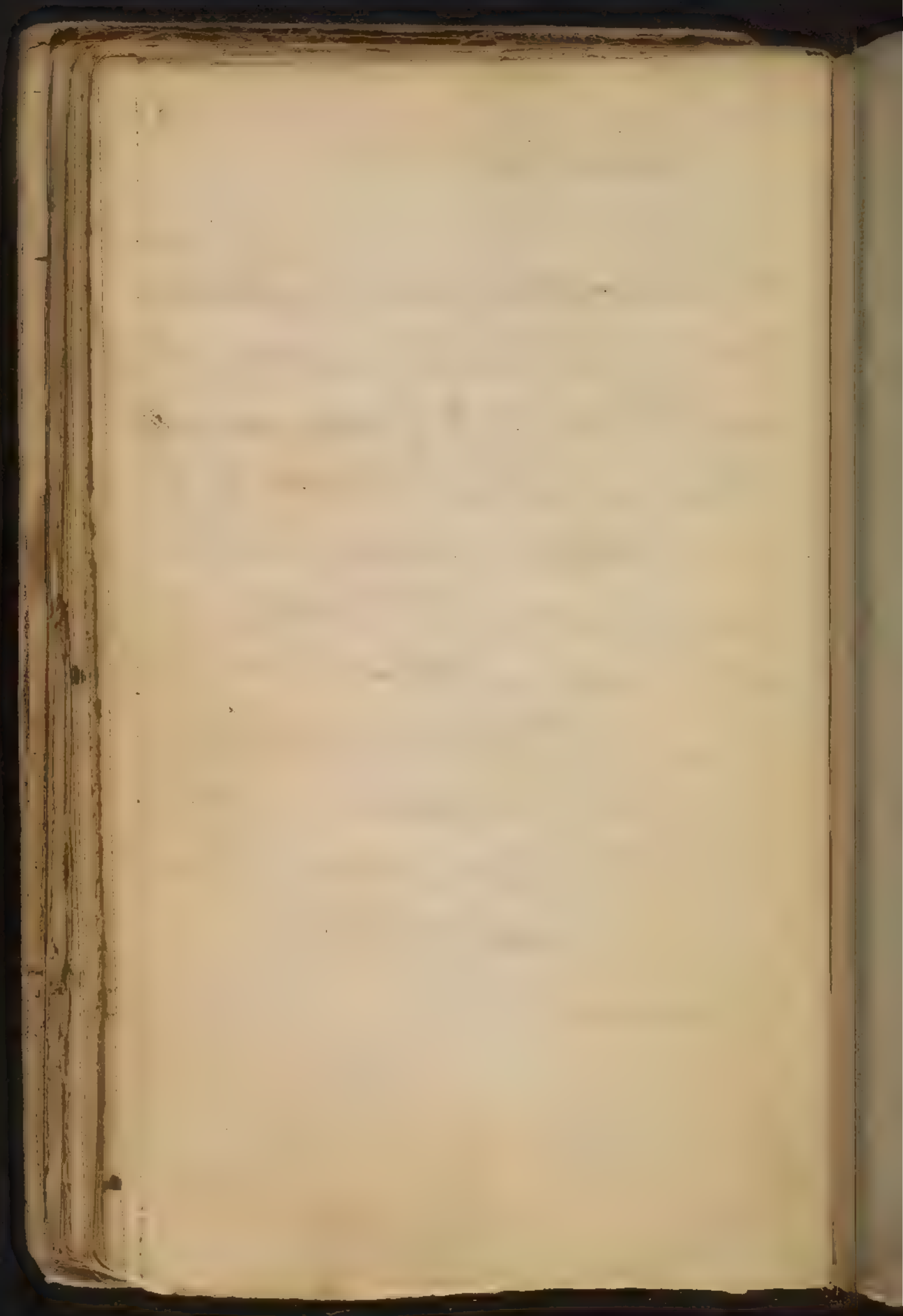
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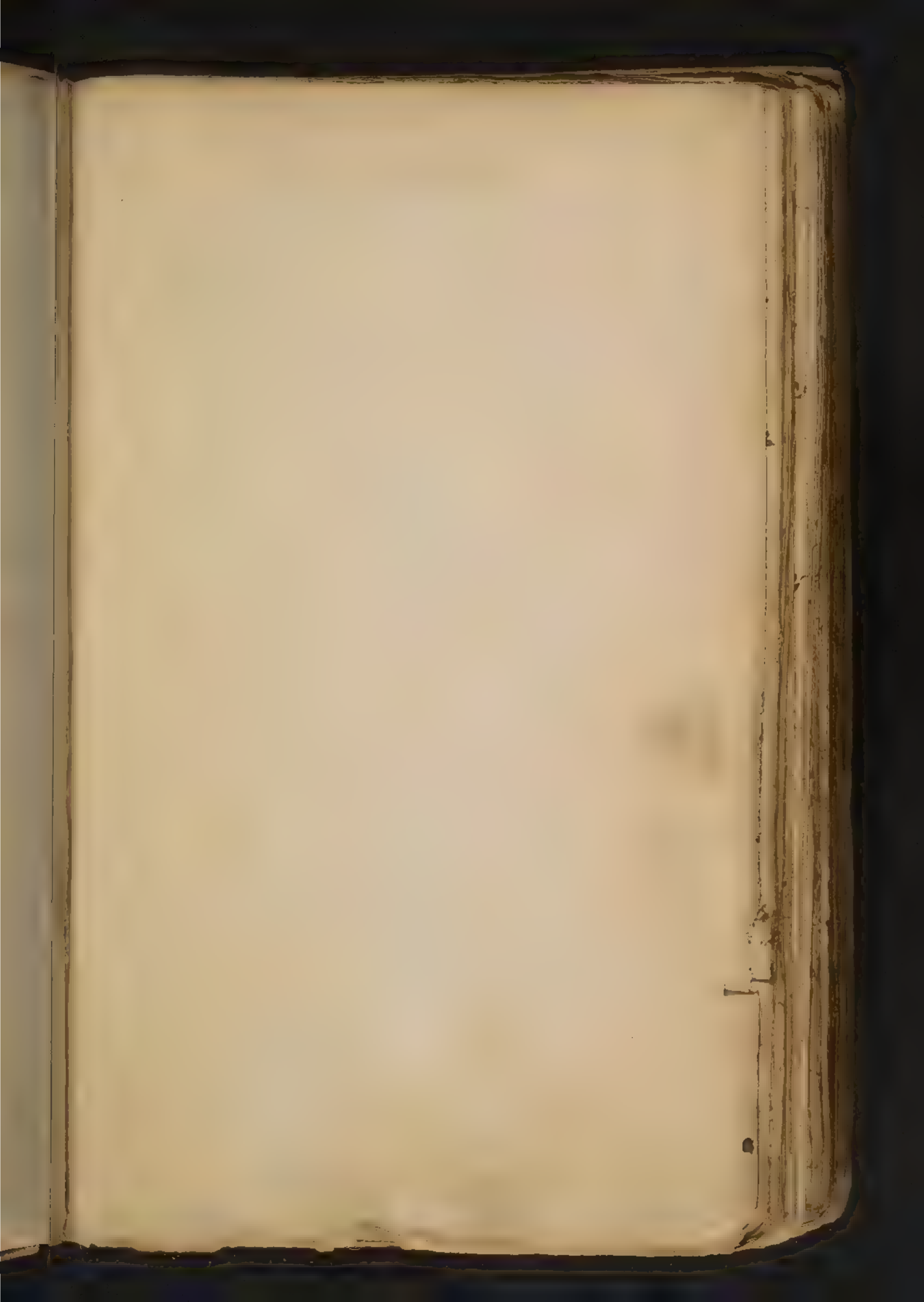
## Secretion

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Fermentation must be called in to aid: for Secretion as well as the mere Structure of the Glands, especially in those Cases where Follicles take place. Altho' we have no Instances of Fermentation in a healthy Body yet we have in the diseased. Pus appears to be formed from Serum secreted from the Blood <sup>which</sup> is afterwards changed by a Fermentation into Pus. — See Mr. Gaber's Experiments.







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## of Nutrition.

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This subject comprehends whatever relates to the Support of the Matter of the Body. It may be divided into 2 parts: 1<sup>st</sup> the Support of the fluid parts & 2<sup>nd</sup> into the support of the solid parts of the Body. The 1<sup>st</sup> depends upon Aliment being taken into the Body, & converted into nourishment in the manner we have before described when speaking of the Chyliferous & Lymphatic Systems. I shall therefore only speak of the nourishment of the Solids. we shall enquire what part of the Fluids are applied to

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## Nutrition

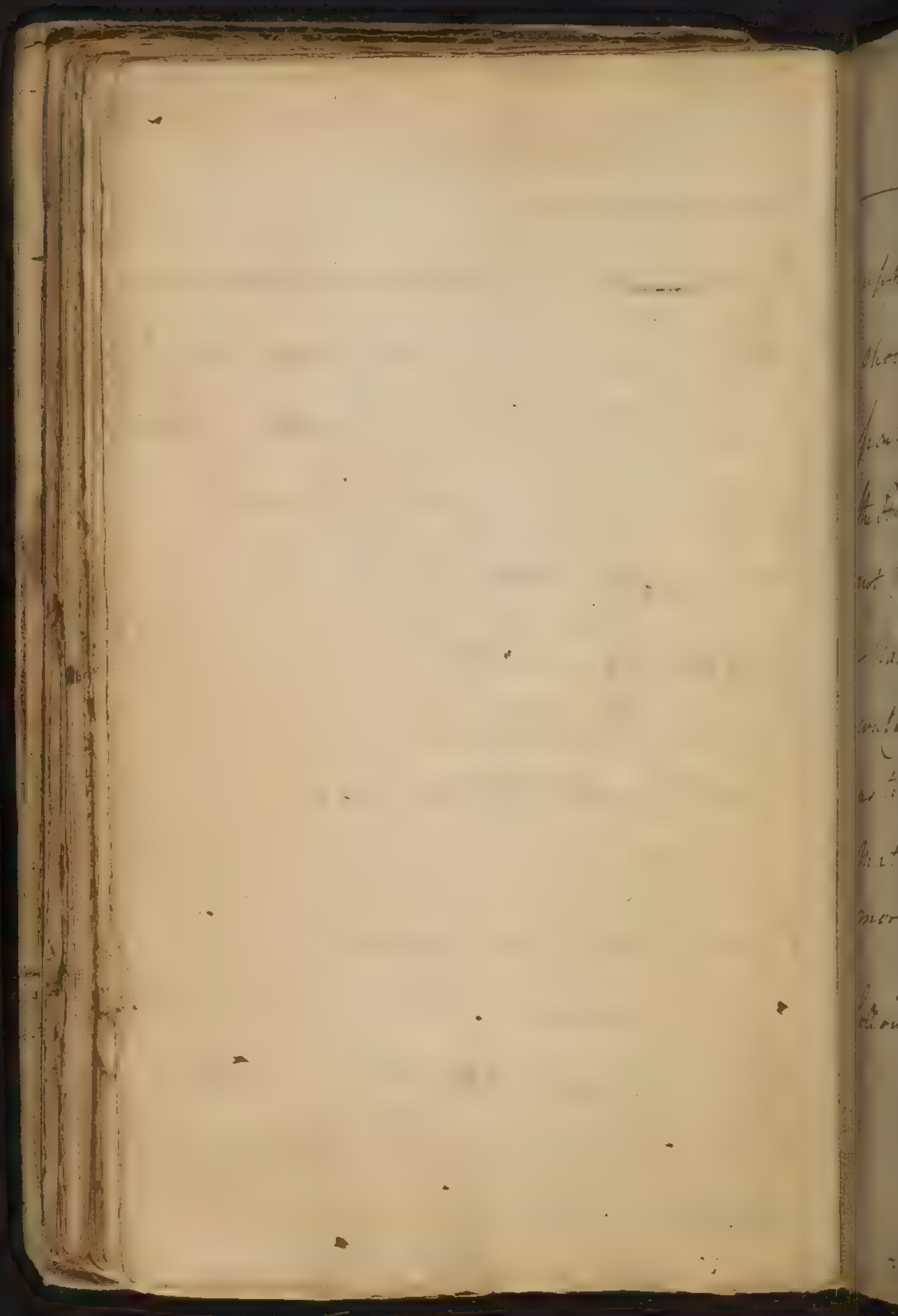
Nourishment the food, & in what manner.

- This inquiry again divides itself into 2 parts 1<sup>st</sup> how Growth is promoted & 2<sup>nd</sup> how a waste of the solid parts is repaired after the Growth has ceased.

I shall begin with the 1<sup>st</sup> Question in the manner the Fluids are applied so as to give Growth to the body. you see how much this Question is connected with the

Organization of all animal & vegetable Bodies in general. But as this subject

admits of no Application in ~~Physic~~ <sup>Physic</sup> I shall pass over it. I only observe that I adopt the doctrine of Stamina w<sup>ch</sup>





## Nutrition

evident  
 appears from the body in its growth  
 showing marks of an evolution of  
 parts previously delineated. Altho'  
 the Stamina of some parts of the body did  
 not exist such as the nails yet such  
 a Nature is originally given to the parts  
 contiguous to these parts if did not exist  
 as to determine precisely the form of all  
 matter applied to it. see this subject  
 more fully discussed by Dr. Haller.

I shall consider Nutrition in the  
 following manner.

- 1<sup>st</sup> What is the proper Nutrition? 2<sup>nd</sup>
- 2<sup>nd</sup> Where this Fluid is separated  
 from the blood?
- 3<sup>rd</sup> In what manner is it thus separated, con-  
 veyed to the smallest Fibres everywhere.

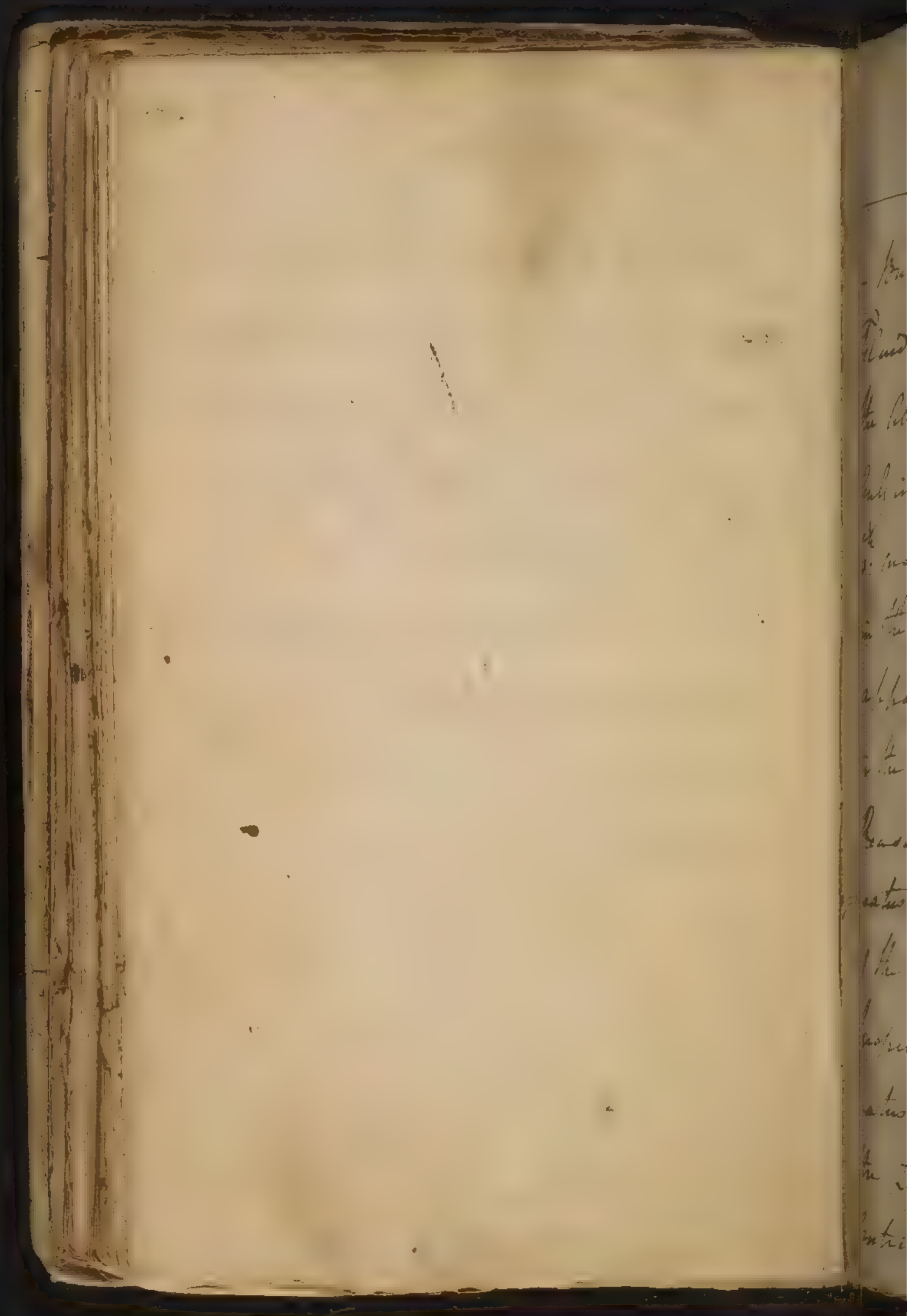
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## Nutrition

Q<sup>4</sup>: How the Fluid <sup>is</sup> nourished  
is applied so as to give Extension &  
Growth. The subject is dark, & all  
we can pretend to is, to offer some  
probable Conjectures on it.

I<sup>st</sup> is the proper Nutrition of the  
— I have said before, <sup>2</sup> this is a Coagu-  
lable Lymph. This inferred from its  
Resemblance to the Albumen of an Egg which  
we know is the only nourishment of  
the Chick. It is always present & in  
great Quantities in the System. It  
is originally formed from our Aliment  
<sup>as</sup> it shows its great use, & absolutely  
necessary presence in the body.





## Nutrition

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- But I infer its being the nutritious Fluid chiefly from its Resemblance to the Albumen Ovi <sup>in</sup> w: differs from it only in being a little more Fluid & w: may have been <sup>the</sup> work of Secretion. in the Reple of the Ven. From this it appears that Nutrition is not performed in the larger Vessels, nor have we any Reason to suppose a secretory Apparatus is provided at the Extremities of the Arteries to give the Lymph a proper Degree of Fluidity. Some Apparatus I grant is necessary to change the Lymph into Albumen or proper Nutritious Matter. This many Physiologists

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## Nutrition

have supposed is performed in the cortical part of the Brain, & hence they have supposed the nerves to be the Excretories of this nutritious fluid when secreted, to all parts of the body. see this enunciated more fully in Dr Boerhaave's Institutes § 440-446.

- This Doctrine has prevailed for near 150 years in the Schools of Physic. Dr Haller is the first Who has opposed it, we shall briefly retail his Objection to it, as I am inclined to embrace Dr Boerhaave's Opinion, - my <sup>own</sup> Argument in Support of Dr Boerhaave's Opinion is 1<sup>st</sup> the Brain is a Gland & 2<sup>d</sup> the nerves are its excretories.

121 The first thing observed in an  
Imbecile by a microscope is the  
Brain & medullary Fibres.



# Nutrition

- The structure of the Brain is evidently  
 a Gland of the Receptian structure. but  
 I shall rest my Opinion upon other more  
 substantial proofs. 2<sup>nd</sup> Dr Boerhaave has  
 proved y<sup>e</sup> an Inelastic Fluid is se-  
 creted in the Brain. now we before proved  
 it could not be designed for Sense and  
 Motion. it must then be designed to  
 nourish the Body. 3<sup>rd</sup> the Nerves are the  
 original Stamina of an Animal Body  
 & all Nourishment is applied to these  
 Stamina, from w<sup>ch</sup> it follows y<sup>e</sup> the  
 Brain & Nerves are necessarily employed  
 in Nutrition. 4<sup>th</sup> Every part of the Body  
 appears to have been either Fibrous

as Dr. Haller tells us <sup>n</sup>: upon macerating  
 the veins they appeared to be cellular  
 but he forgets <sup>n</sup>: maceration may  
 have destroyed their texture. Dr. Haller  
 himself confesses <sup>n</sup>: the bones are formed  
 from fibrous lamina. this is so evident  
 that it may be seen in <sup>L</sup> of osseum  
 - if it ever disappears it is owing  
 to matter being effused w: <sup>ch</sup> obliterated  
 the fibrous texture: the tendons



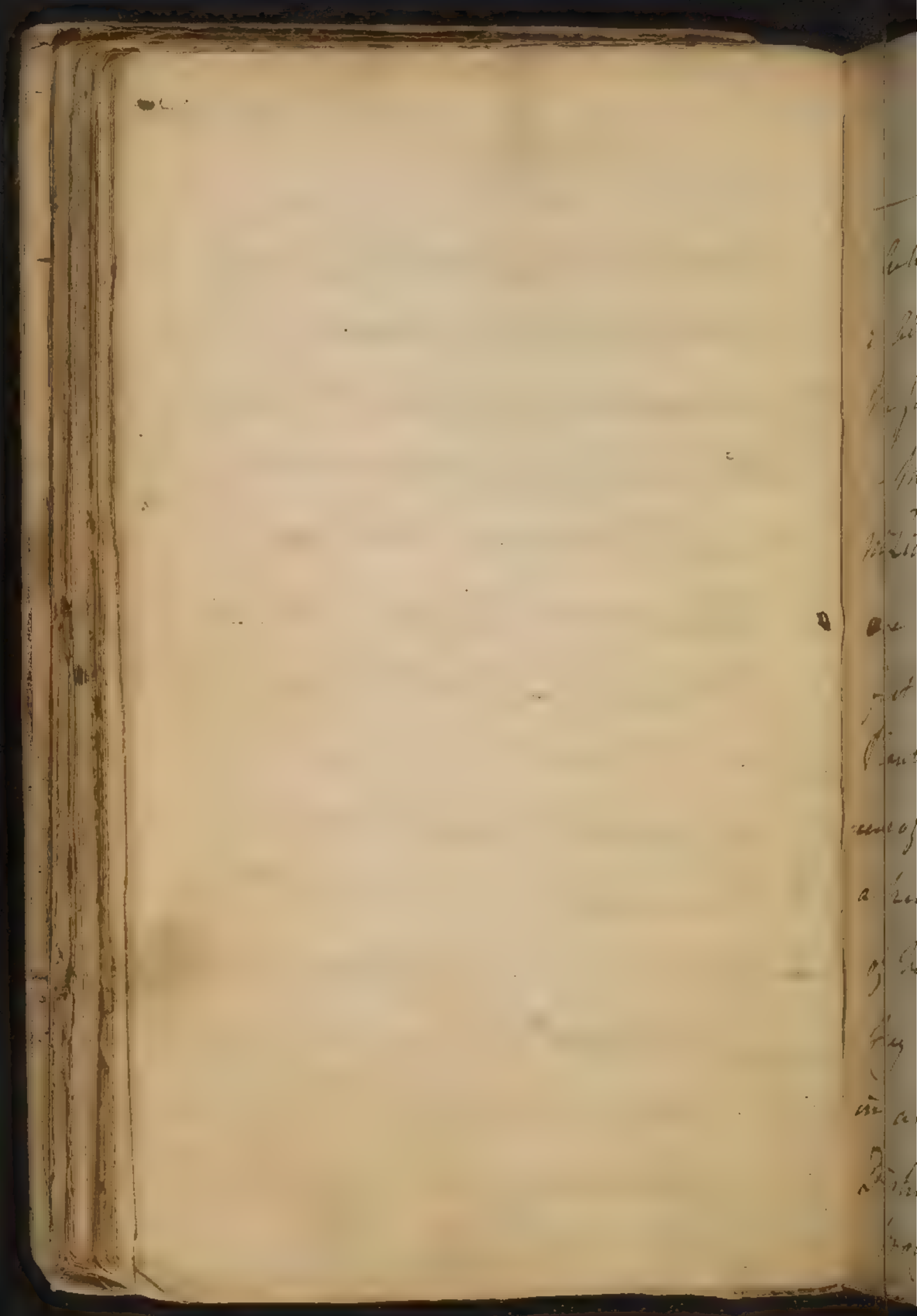
or cellular originally. The cellular  
parts appear to be formed by an  
After Accretion. This is sometimes evi-  
dent to our Eyes. & is proved from the  
Phenomena of many Diseases. It is always  
in a determined Quantity in all Animals  
of the same Species. This only can depend  
upon Haminal Fibres directing its  
Arrangement. But w<sup>h</sup> shall we say to  
the veins? They have some t<sup>h</sup>at are  
Fibrous but are cellular<sup>ly</sup>. but negative  
proof avail nothing. we find a Fibrous  
Structure in the Dura Mater<sup>ch</sup> w<sup>h</sup> is capa-  
ble of forming<sup>277</sup> a cellular appearance  
from w<sup>h</sup> it appears highly probable y<sup>t</sup>  
the veins are Originally Fibrous.

we know were ~~are~~ muscular, & were  
possessed of Sensibility & Irritability but  
by age loses them both together with  
their fibrous appearance, yet surely  
no one will deny their being originally  
Fibrous.



## Nutrition

This answers the first & 2<sup>nd</sup> questions we  
 proposed & in some measure the 3<sup>rd</sup> for  
 if it is secreted in the Brain it is highly  
 probable it is conveyed to all parts of the  
 body by the nerves. But I go on w:  
 the arguments I began with. 5<sup>th</sup> the  
 only fibrous parts of the body w:  
 serve are the nerves. no one I think  
 has denied their fibrous structure. They  
 all terminate in muscles w:  
 formerly said were always fibrous. Dr. Haller  
 supposes that the Growth & Extension  
 of the body together w:  
 of the Lamina depends upon the action  
 of the Heart & Arteries. But the





## Nutrition

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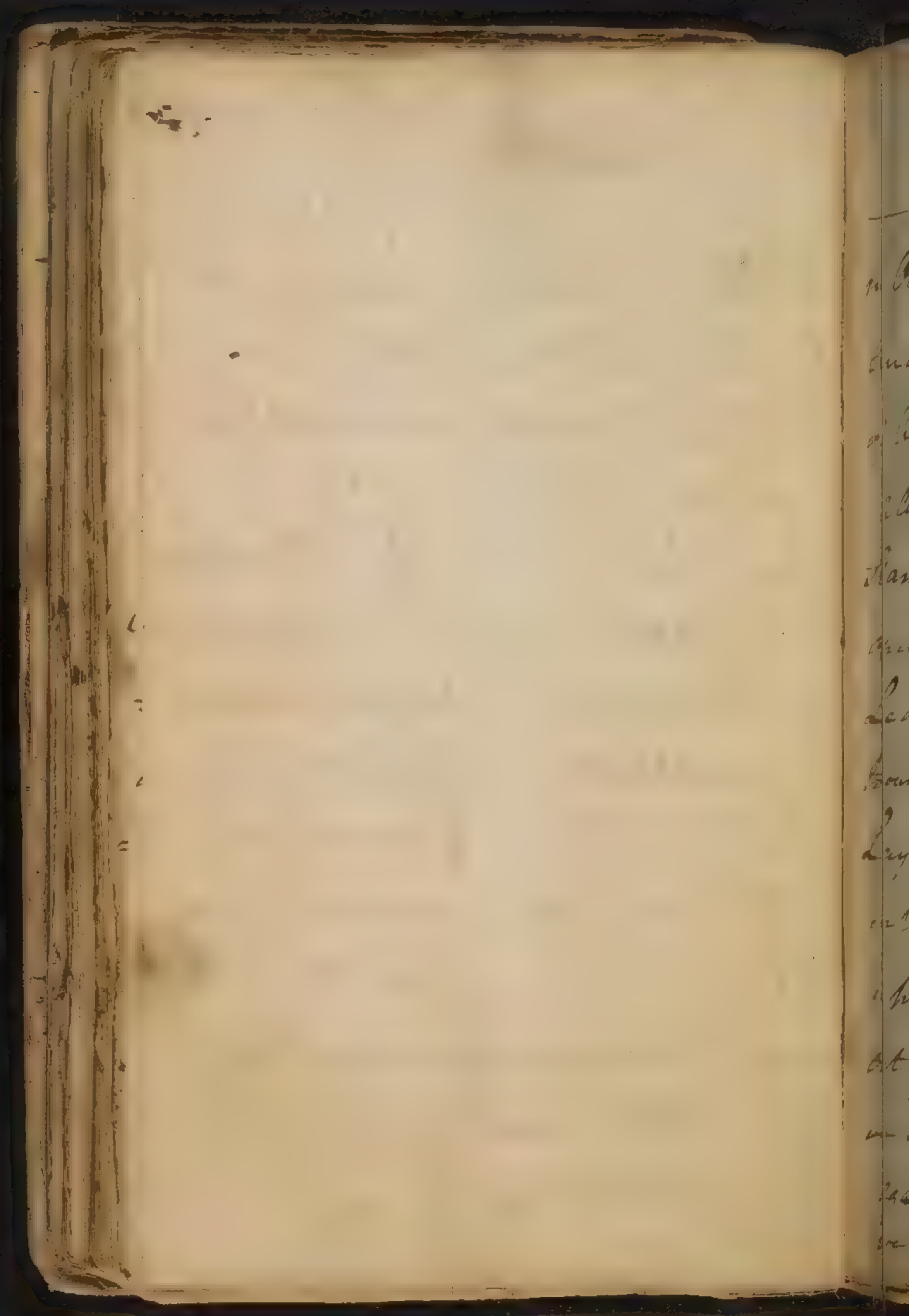
Action of a Brain & a Nervous System  
 is absolutely necessary to account for  
 the first action of the least Plant.  
 - There are late Observations by our  
 Nations<sup>ch</sup> which show us that ~~the~~ Animals  
 are originally in a vegetable state.  $\frac{e}{y}$   
 first thing<sup>ch</sup> which evolves the Germen of  
 Plants is Heat, & we can best com-  
 prehend the Production of Heat first on  
 a nervous System. The nourishment  
 of Vegetables depends on a nervous System  
 they contain of Fibres distributed  
 in an Analagous manner to the  
 Distribution of Nerves in an Animal  
 body. It is no matter how whether they

(a) By Injection here we are to understand  
- certain coloured Liquors so placed  
in the Roots of Plants that they colour  
- the them.



## Nutrition

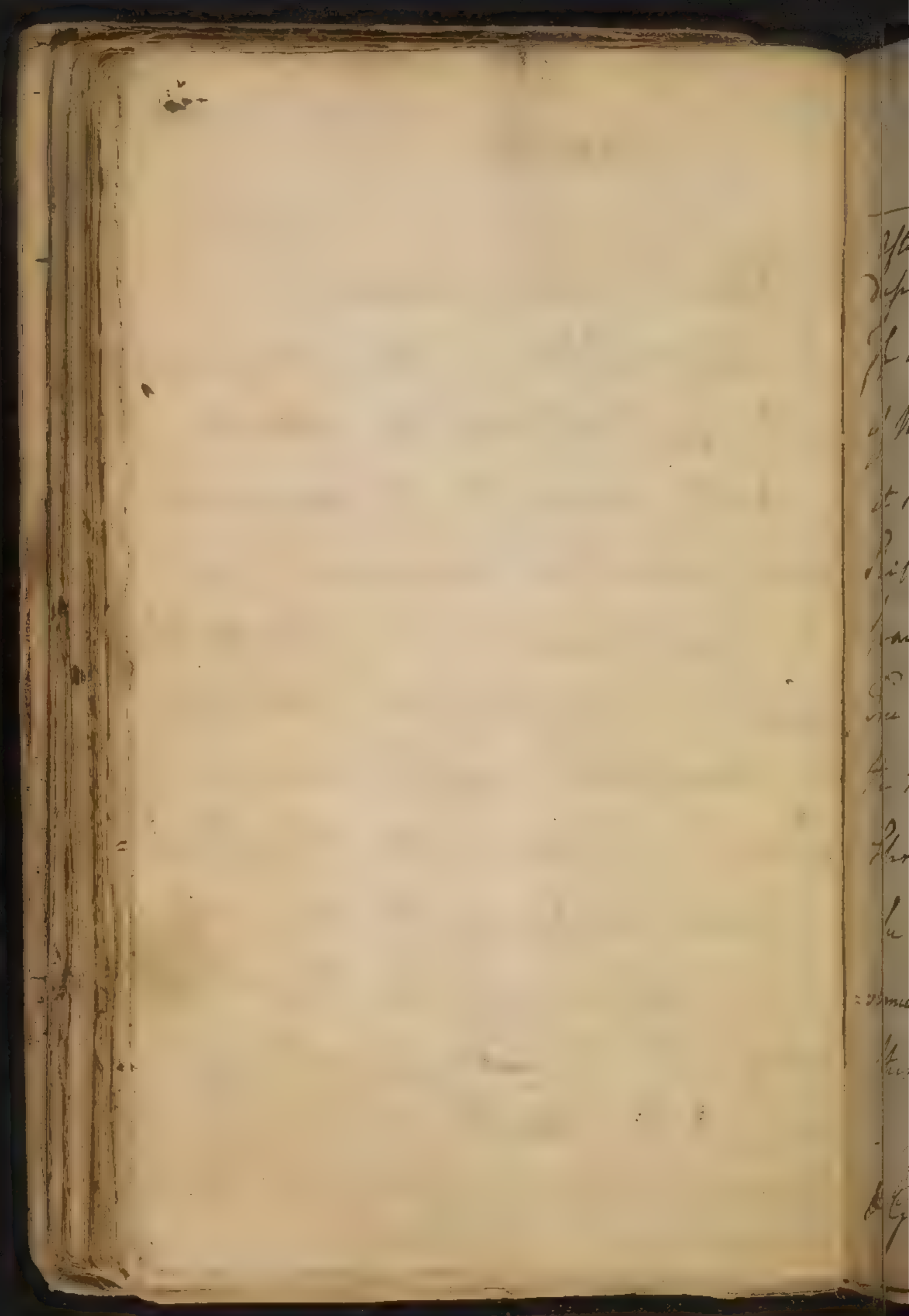
Fibres are tubular or spongy. This does not affect our Question. The Fibres do not ramify, but proceed in straight Lines like nerves. They have lately been injected by colour Liquor, which always appeared in distinct separate Lines. When they appear to ramify they only split into finer Filaments. Moreover by maceration they always separate into distinct Fibres. upon the whole <sup>no</sup> ~~any~~ Observation shows us <sup>an</sup> Analogy between the nerves of plants and the vessels of animals. we have





no Observations that tend to show any  
analogy between the Blood Vessels  
of Animals & the Vessels of Plants.

All Plants Spring from Original  
Stamina which may be seen by  
opening a Pinnon more especially their  
Leaves. But I return to apply this  
to our present subject. Every Year there are  
Layers accreted to the Tree from the  
internal Surface of the Bark. This  
is proved by cutting a piece of Bark  
out of a Tree & <sup>fastening</sup> a piece of tin plate  
over it, & then <sup>shutting</sup> the Bark over it  
again, & tying it closely to the Tree. if  
we examine this tin Plate some Years





## Nutrition

263

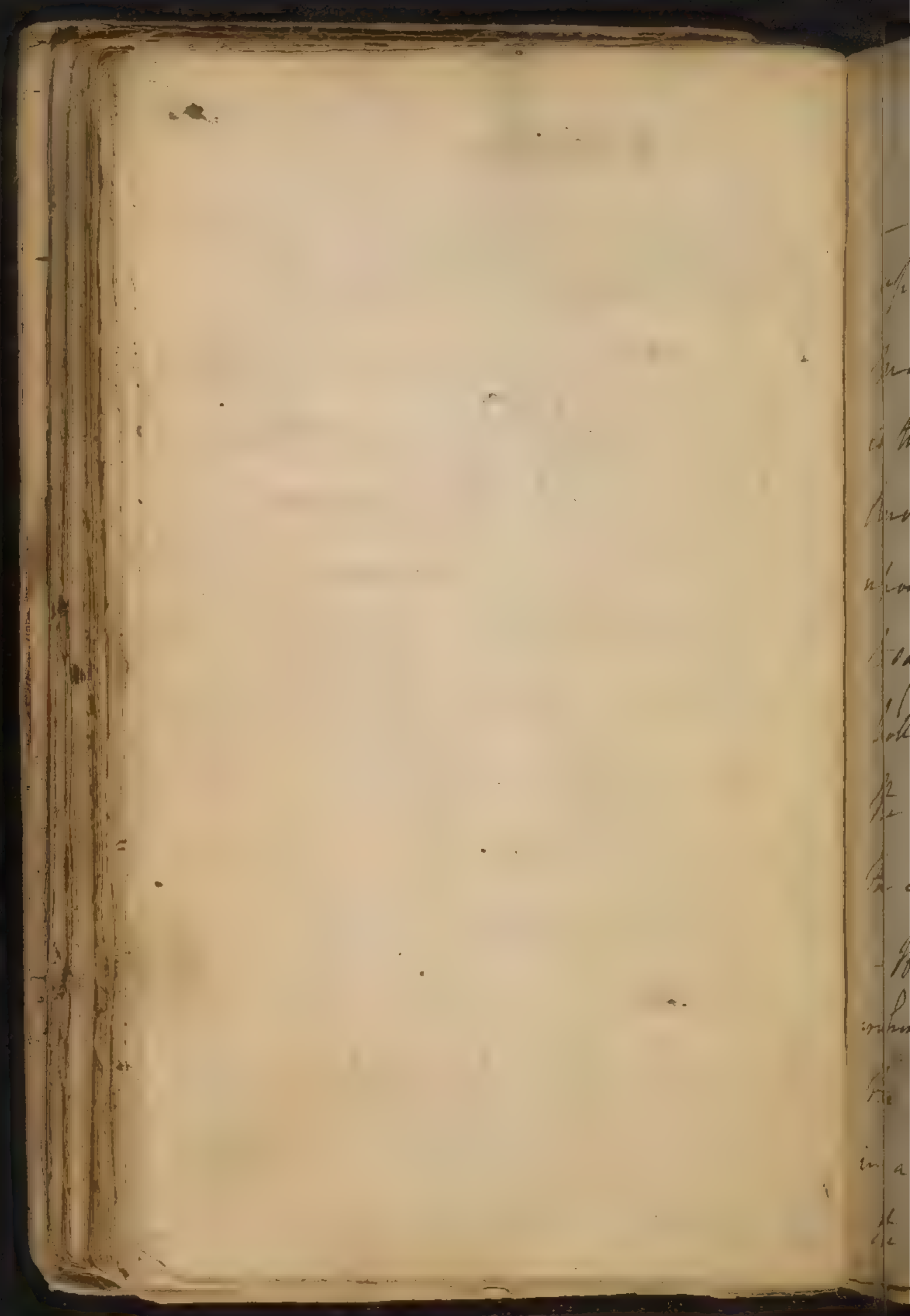
Afterwards we shall find it sunk pretty deep into <sup>the</sup> substance of the Tree.

If we examine the internal structure of the Bark of Trees we always find it Fibrous. all the Cordage used in Ship Building is procured from this part of Vegetables. Every year the Tree receives a Layer of Fibres from the <sup>the</sup> Bark which may <sup>be</sup> seen in the Spring of the Year. I grant there may

be a great accession of cellular substance to ~~the~~ Trees as in the Fruit, but

this arises from Original Stamina.

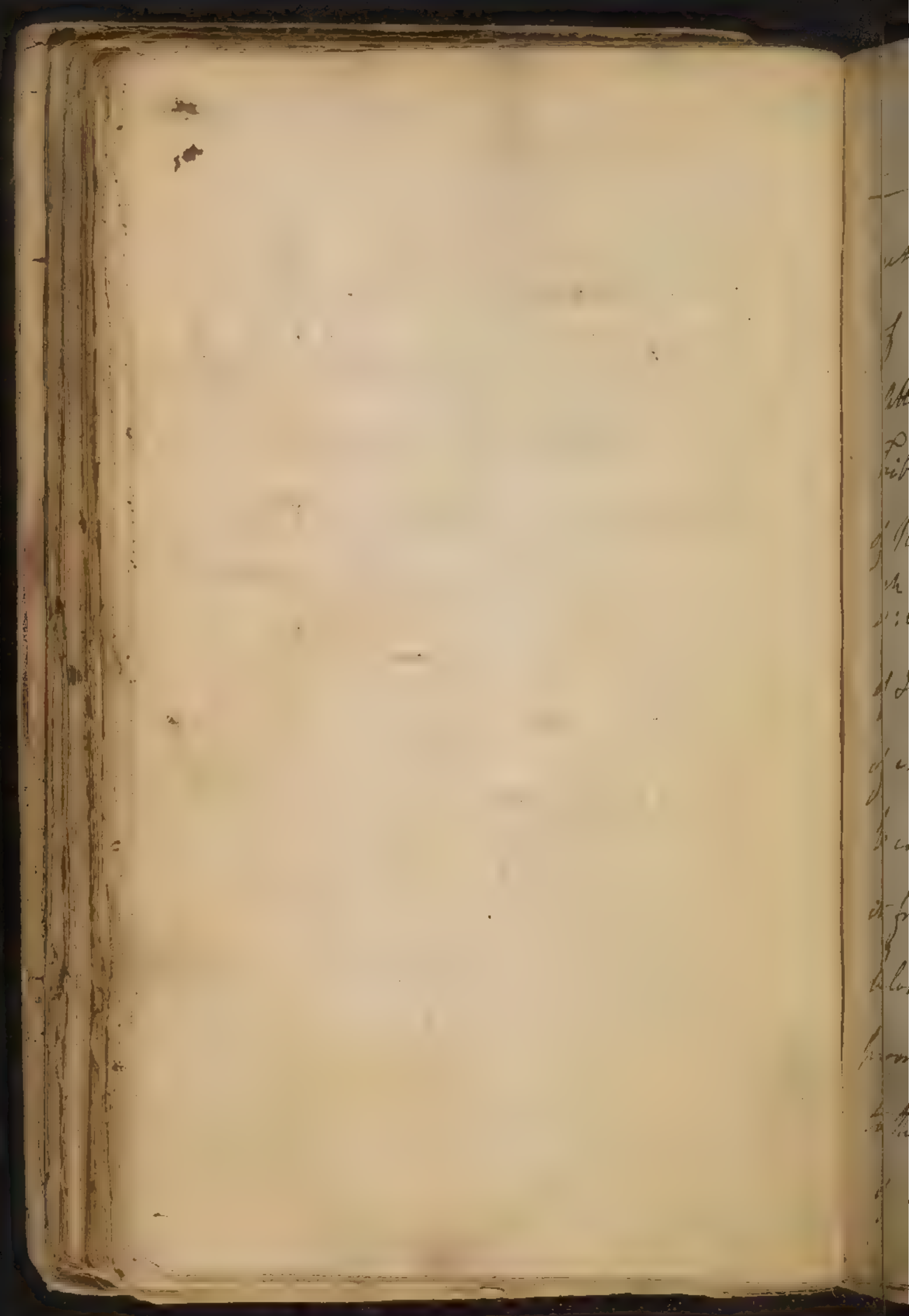
from <sup>this</sup> all, I conclude the Form & Growth of Plants depends entirely





## Nutrition

upon a fibrous structure. The use  
made of this very beautiful Analogy  
is to prove that the nourishment of  
Animal Bodies likewise depends  
upon Nervous Fibres. I do not pretend  
to say whether these Nervous Fibres are  
hollow Tubes. We have no proof <sup>+</sup> if  
the Tubes of plants are hollow, but on  
the contrary <sup>that they</sup> are of a spongy structure.  
- If these Fibres then transmit nou-  
rishment to plants, may we not infer <sup>+</sup>  
the nerves convey nourishment  
in a like manner. even supposing  
the vessels of plants are tubular





## Nutrition

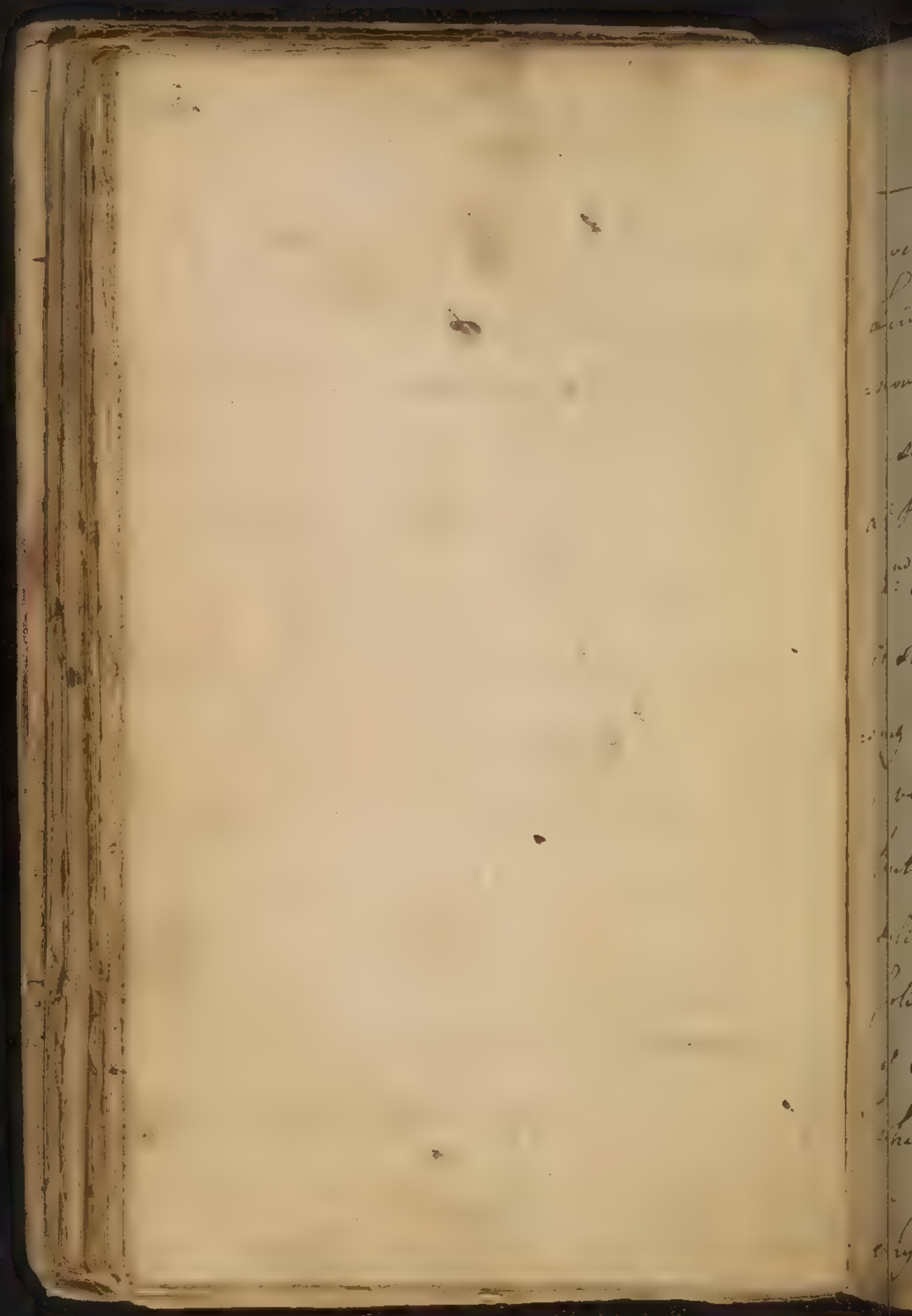
yet we know of no power capable  
 of moving Fluids in them. Capill<sup>r</sup>  
 Attraction acts as well in a Spongy  
 Fibre as in a hollow Tube. The Fibres  
 of Plants have a subtle Fluid in y<sup>m</sup>:  
 w: we know from their being insens<sup>ch</sup>  
 of Irritability in consequence of y<sup>e</sup> action  
 of external Bodies on them. I choose  
 to call it Irritability to distinguish  
 it from Sensibility <sup>ch</sup> w: more properly  
 belongs to animals. The trinity we see  
 promotes the growth of plants almost  
 to the Eye. Light <sup>ch</sup> w: shows us y<sup>e</sup> presence  
 of some fine Ether in them. so that

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you see Plants are possessed of a  
Nervous System & on w<sup>h</sup> their Nu-  
-trition & Growth depend. And if this  
is the case in plants we may venture  
very confidently <sup>to say</sup> something analogous  
must take place in Animals.

However plausible this Theory may  
appear Haller has raised objections  
to it in the 8<sup>th</sup> Chapter of his 10<sup>th</sup> Book.  
I do not agree from Cause & the tissue  
waxing in Paralytic Diseases. The shrink-  
-ing <sup>arises</sup> ~~arises~~ from a diminution of the  
Fluids. we have no proofs of a solid  
being formed in consequence of a  
Palsy. Nutrition appears to go on as





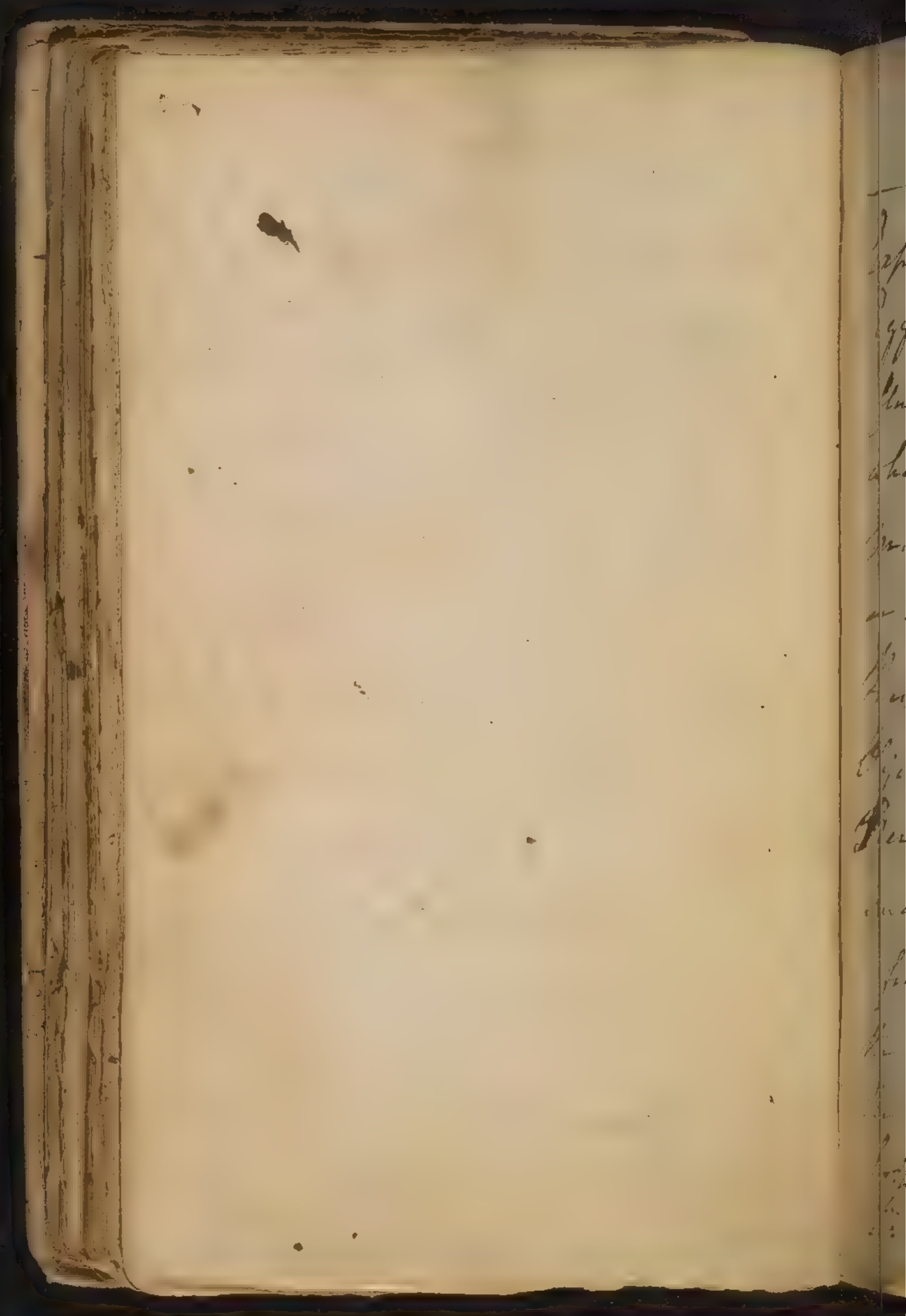
well as even. the Shrivelling of the  
Limbs affected w: Paralysis is easily re-  
-moved by restoring their Fluids to them.

- so that a Dr. Haller need not have been  
at the pains of refuting his Argument.

2<sup>nd</sup> He supposes the Quantity of <sup>e</sup> Serum  
is so great that the nourishment suffi-  
-cing this hum w: be too fluid to con-  
-vey the nourishment of the Bones.

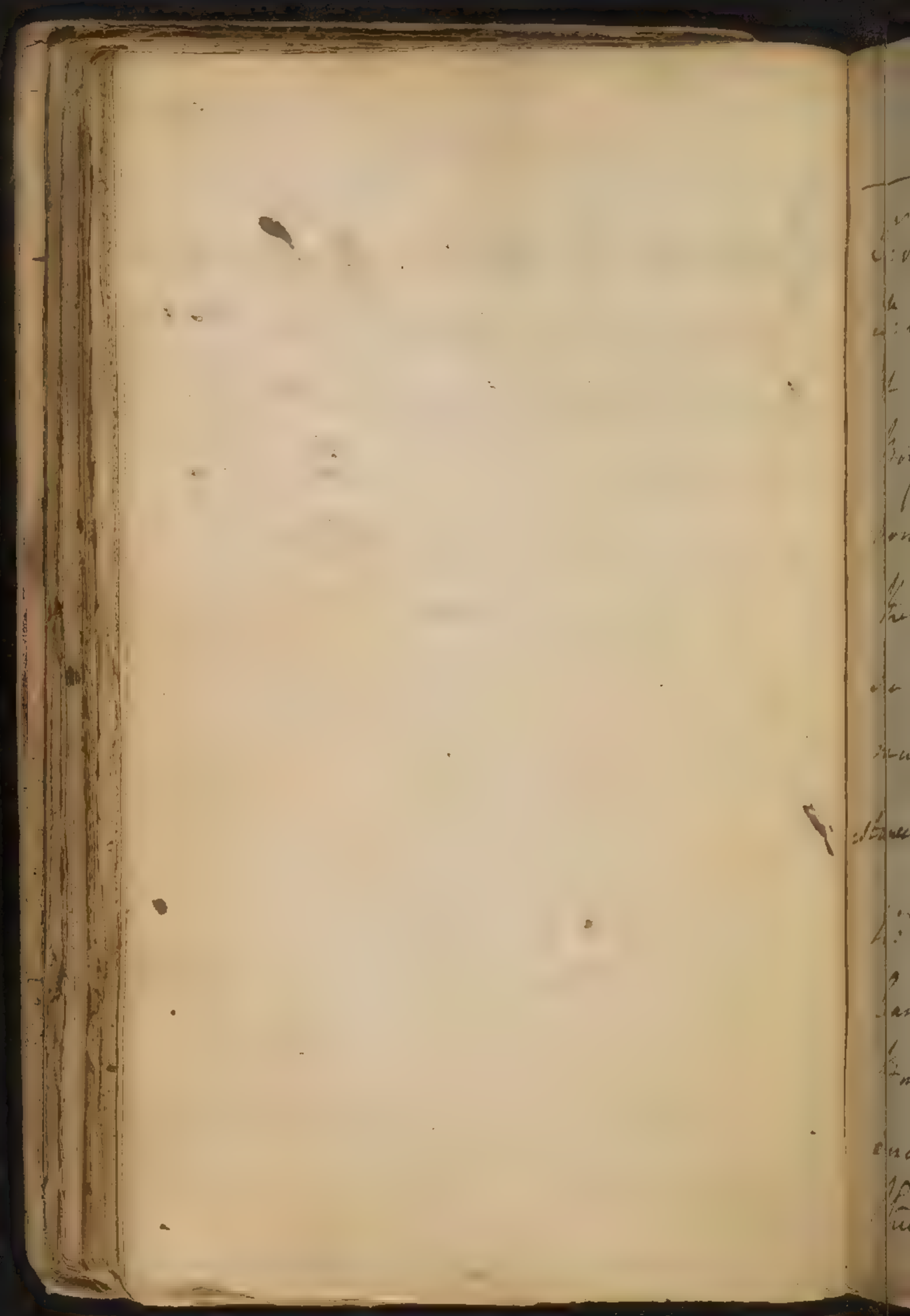
but this is no Objection. it may carry  
solid matter <sup>th</sup> w: it deposits <sup>ch</sup> any  
Solids. the Liquor <sup>ch</sup> w: forms y<sup>e</sup> shell  
of Snails is extruded thro' its body  
when it preexists in a fluid state.

- Fish & a Spider web were originally  
very fluid, but become hardened. by



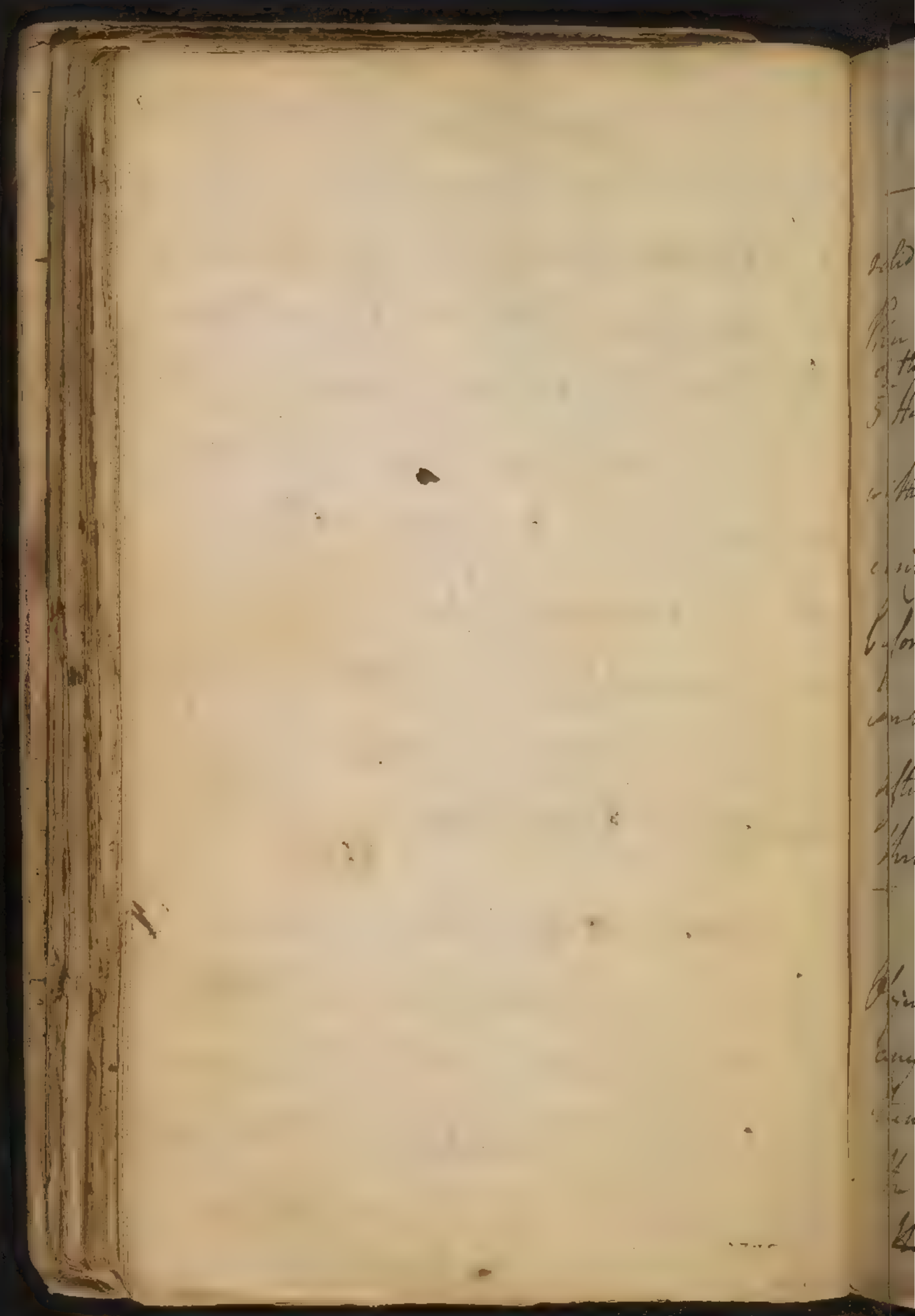
Exposure to the Air. the shell of an  
egg every body will see soft & as a  
fluid, but how hard does it become  
when exposed to the Air! In the same  
manner there is an Opaque Matter  
in our nourishment! the brilliancy  
then of the nourishing fluid is no  
objection to its passing thro' the  
Nerves. nor are the nerves too  
small to admit of this nourishment.  
For I do not maintain that it is  
the medium of sense or motion. on  
the contrary I maintain that these  
both depend on a subtle Plastic Matter  
which is peculiar to the nerves.





3<sup>rd</sup> He says there are many animals  
which live & grow that have no nerves.  
& that there are some parts of the  
body which have no nerves & yet are  
nourished. But this is no Physician  
the 1<sup>st</sup> is evidently false, & whenever we  
see animal matter without nerves we  
must consider it is cellular substance  
or stroma effused and according to fibres.

4<sup>th</sup> He says the greatest Viscera having  
least nerves as the Liver Lungs &c.  
But he mistakes their Bulk by  
including their Fluid, to which they owe  
their Life. For my part I think them





solid matter is exactly proportioned to  
the nerves, in <sup>the</sup> same manner as the parts  
of the body

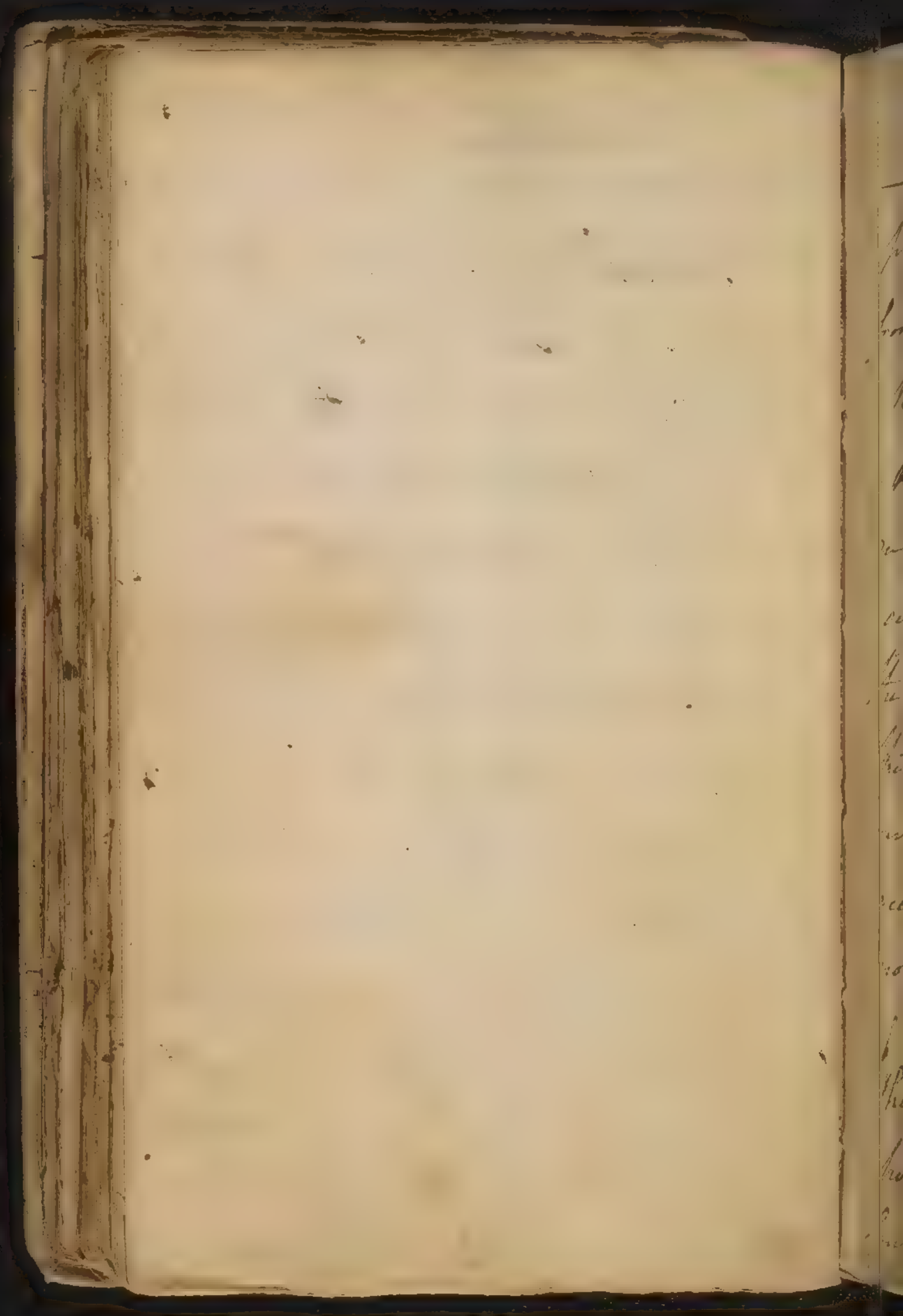
5: He says there are cases of atrophy  
without a loss of sensation. This may  
easily be accounted for from w: we said  
before. The other of the nerves may  
continue to transmit sensations  
after the passage of the nourishment  
this then is obstructed.

This finishes our list of Objections.  
I do not think them of  
any force, nor am I induced by  
them to desert my opinion, but on  
the contrary am more confirmed in  
them.

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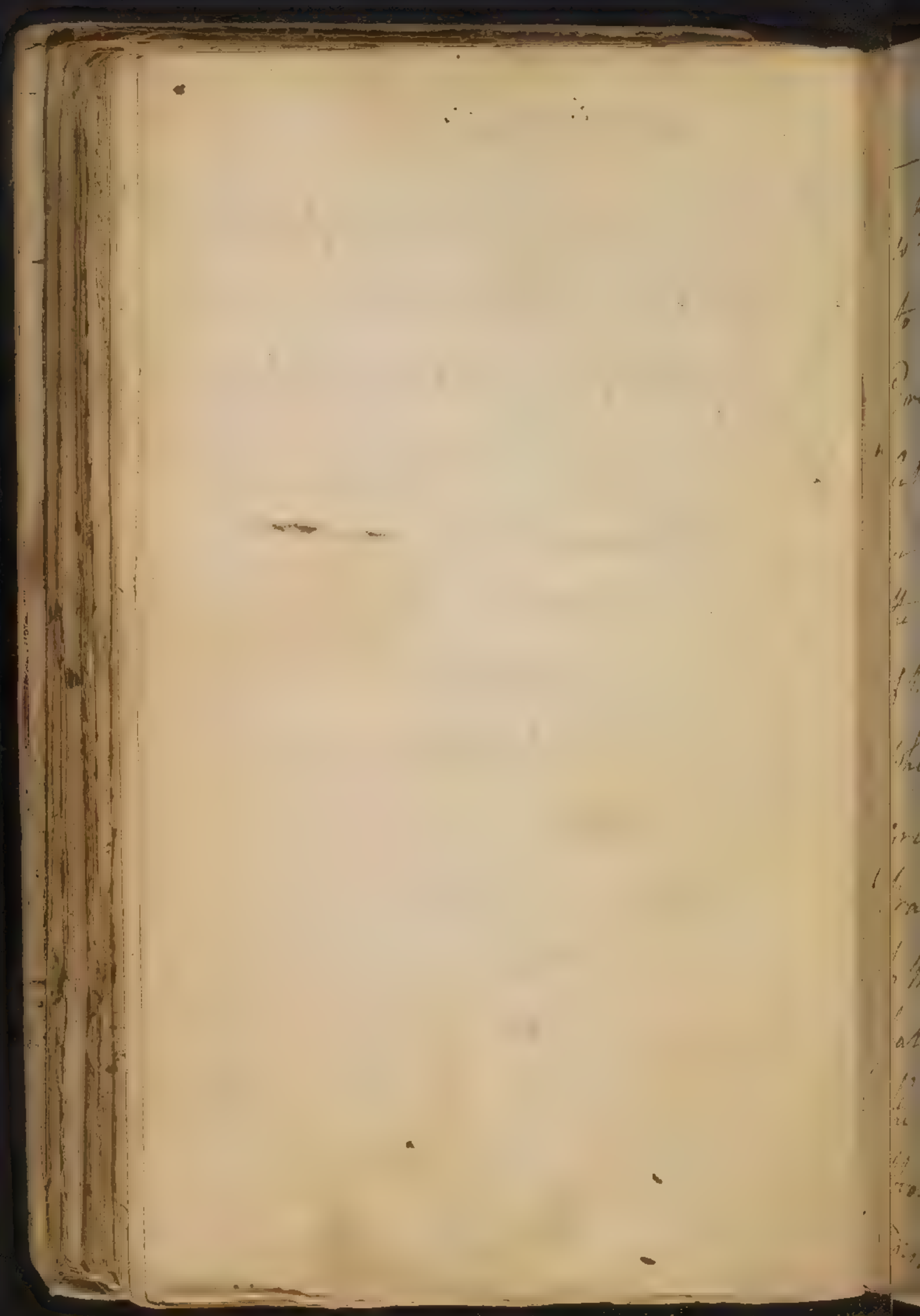
3<sup>rd</sup> In what manner is this nourishment thus separated & transmitted to the solids applied to them? This is a most difficult question. it is not enough that we have found that nourishment is applied to our solids, we must now enquire how it is applied to them. Let us here we must again call in the aid of the Physiology of Plants! it is a well known fact that if any common vegetable is brought into a warm Room in the dead of winter vegetation immediately appears in it. This has been attributed by botanical Physiologists to Heat's





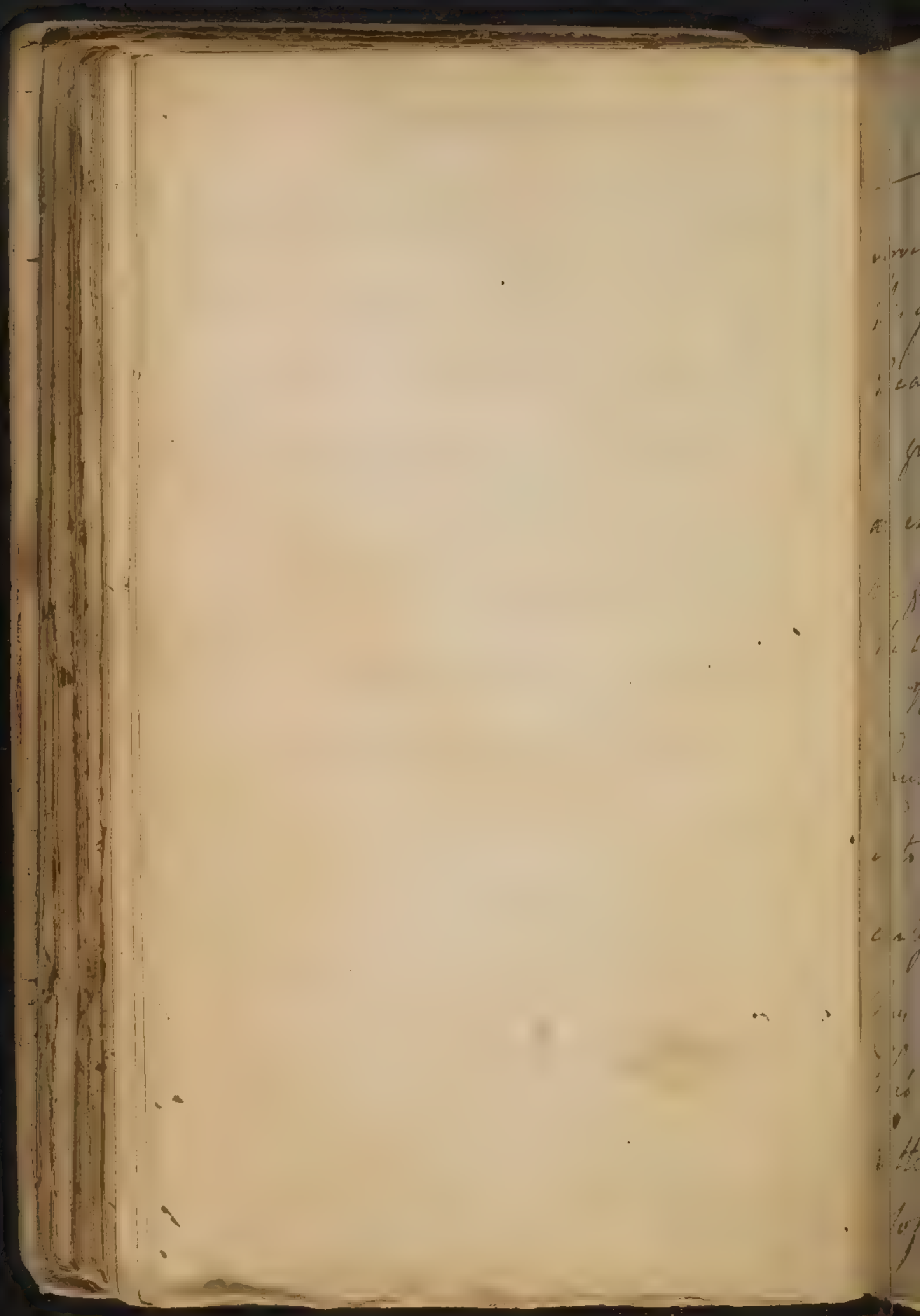
Promoting the Circulation of the Sap  
from the Root up thro' its Branches.

- But if the same plant is placed behind  
a hot House in such a manner as y:  
one of its Branches can <sup>insinuate</sup> ~~insinuate~~ it:  
- call into a window in the hot House all  
the marks of vegetation appear in  
this Branch while the rest of y<sup>e</sup> plant  
remains dry. How shall this be  
accounted for? Here the Heat could  
not act so as to promote y<sup>e</sup> Circulation  
of the Sap from the Root. it must  
then depend upon Heat or some other  
power y<sup>e</sup> heat the vegetable into a  
condition fit to receive an aërial





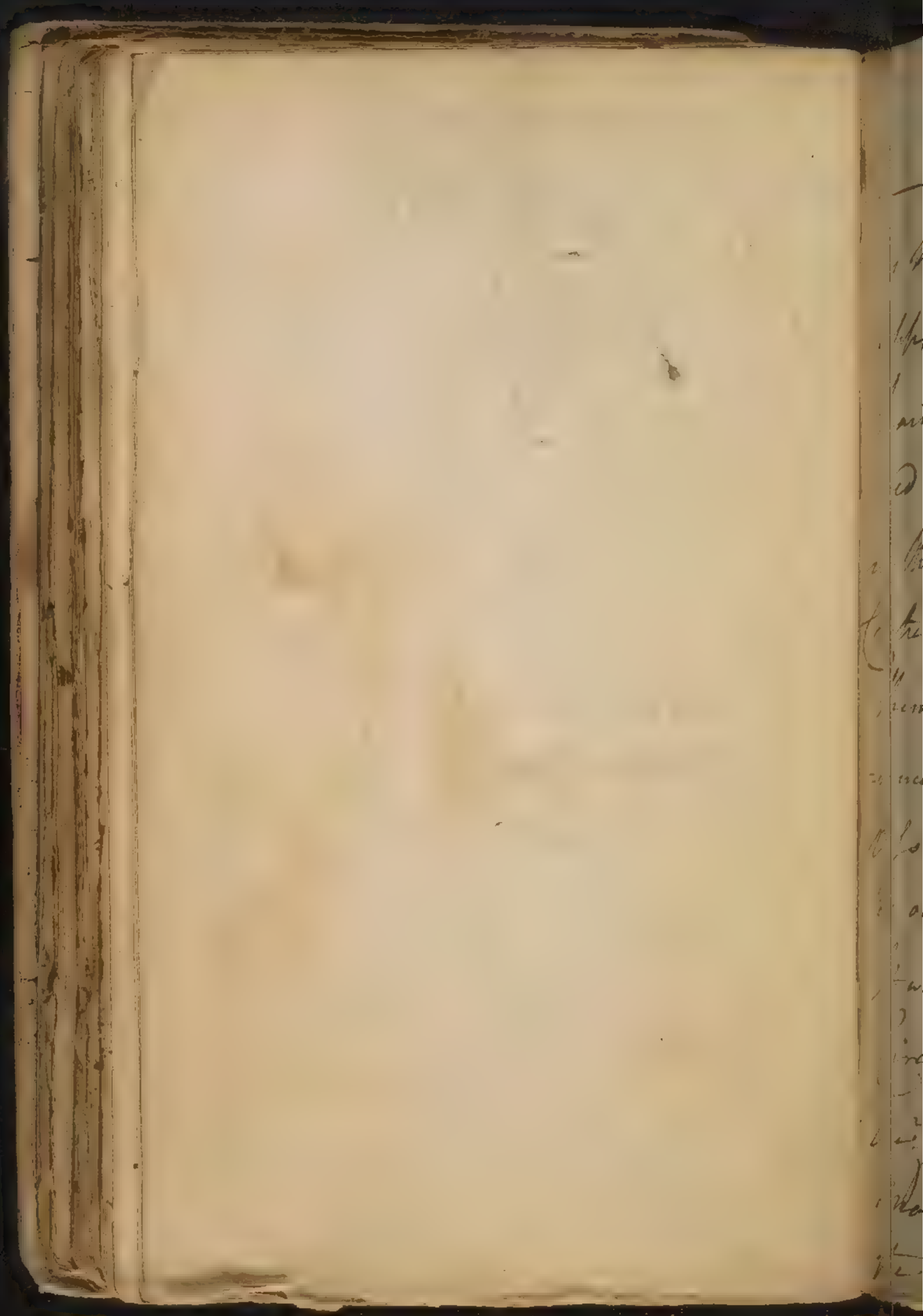
is: this I own is <sup>to</sup> it is not our purpose  
to enquire. But in Animals the  
Growth of the solid depends upon the  
Action of the Heart extending <sup>thru</sup> them. Hence  
we always find Growth proportioned to  
the Action of the Heart or the Distend: power  
of the Blood. Those parts grow most  
where the Impetus of the Blood is  
greatest, hence the great Size of the  
Brain <sup>ch</sup> in Infants is never proportioned  
to the rest of the Body. The more lax &  
patent the vessels in any part are  
the quicker & greater the Growth of  
those parts <sup>ch</sup> to w. These vessels are  
distributed. This in a few words may



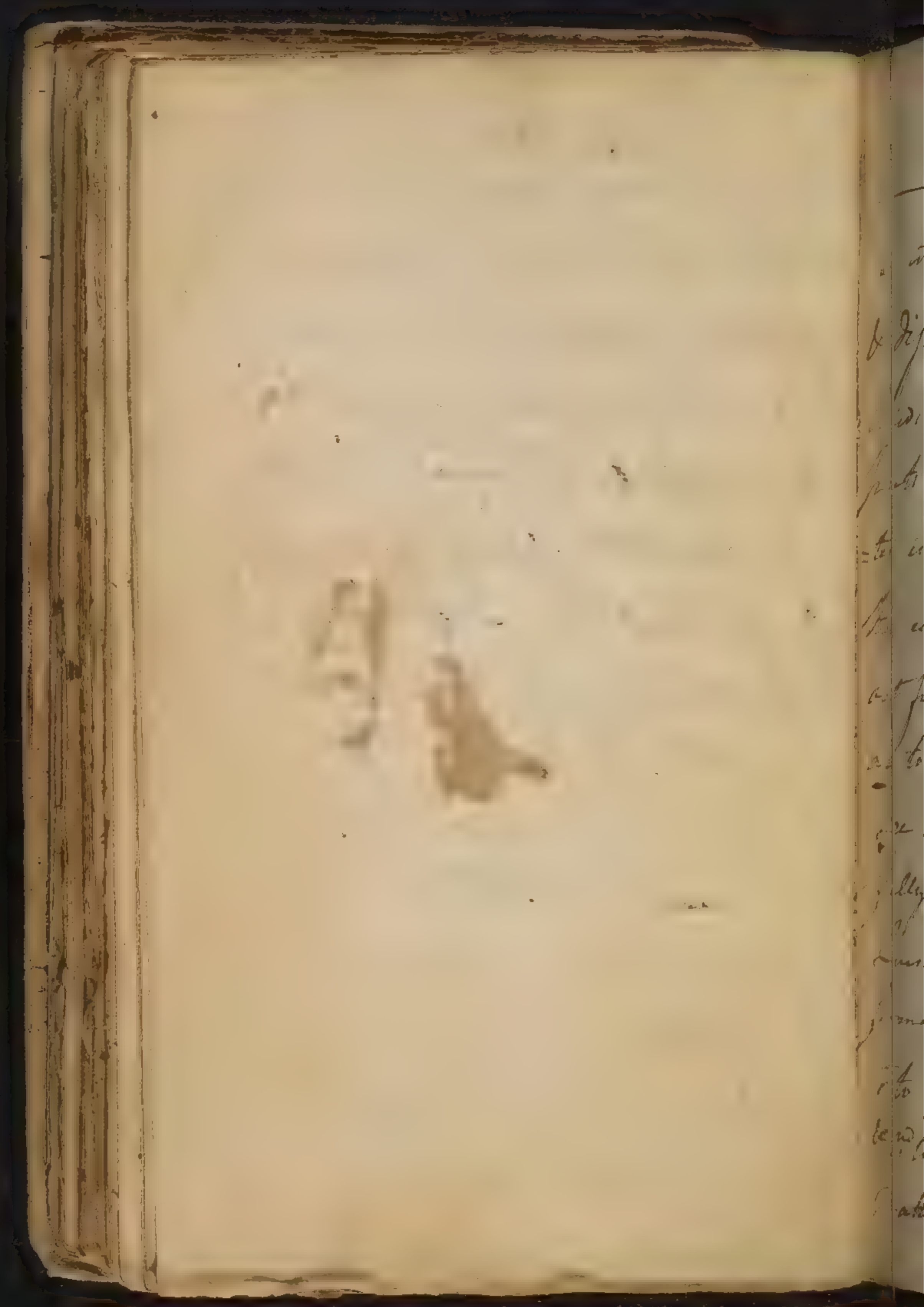
serve to evolve <sup>the formation of</sup> the Animal System. From  
this you may easily comprehend the  
Reason why the body continues  
to grow till the Lungs & Heart are in  
an exact balance w: each other so that  
the former resists the extending power of  
the latter.

But before we enquire into the  
Cause of stop growth let us enquire  
into the formation of the bones. These  
early appear in the Original Stamina  
they are at first soft & gelatinous, but  
this time become so hard as to show  
little flexibility. During their  
soft state they are colourless but





as they become Cartilaginous they appear yellow, & when they become hard or Bony they evidently show red vessels <sup>ch</sup> w<sup>h</sup> may be seen 1: in the middle of long bones & in 2: Centre of short ones gradually extending themselves towards the Ends & Circumference of the said bones: These blood vessels proceed in right Lines w<sup>h</sup> is obvious to our ~~sense~~ Senses. From these Facts it will appear that the power of Circulation must be called in to assist for the Formation of Bones. the Matter of the Bones is different from the Matter of the soft parts. It

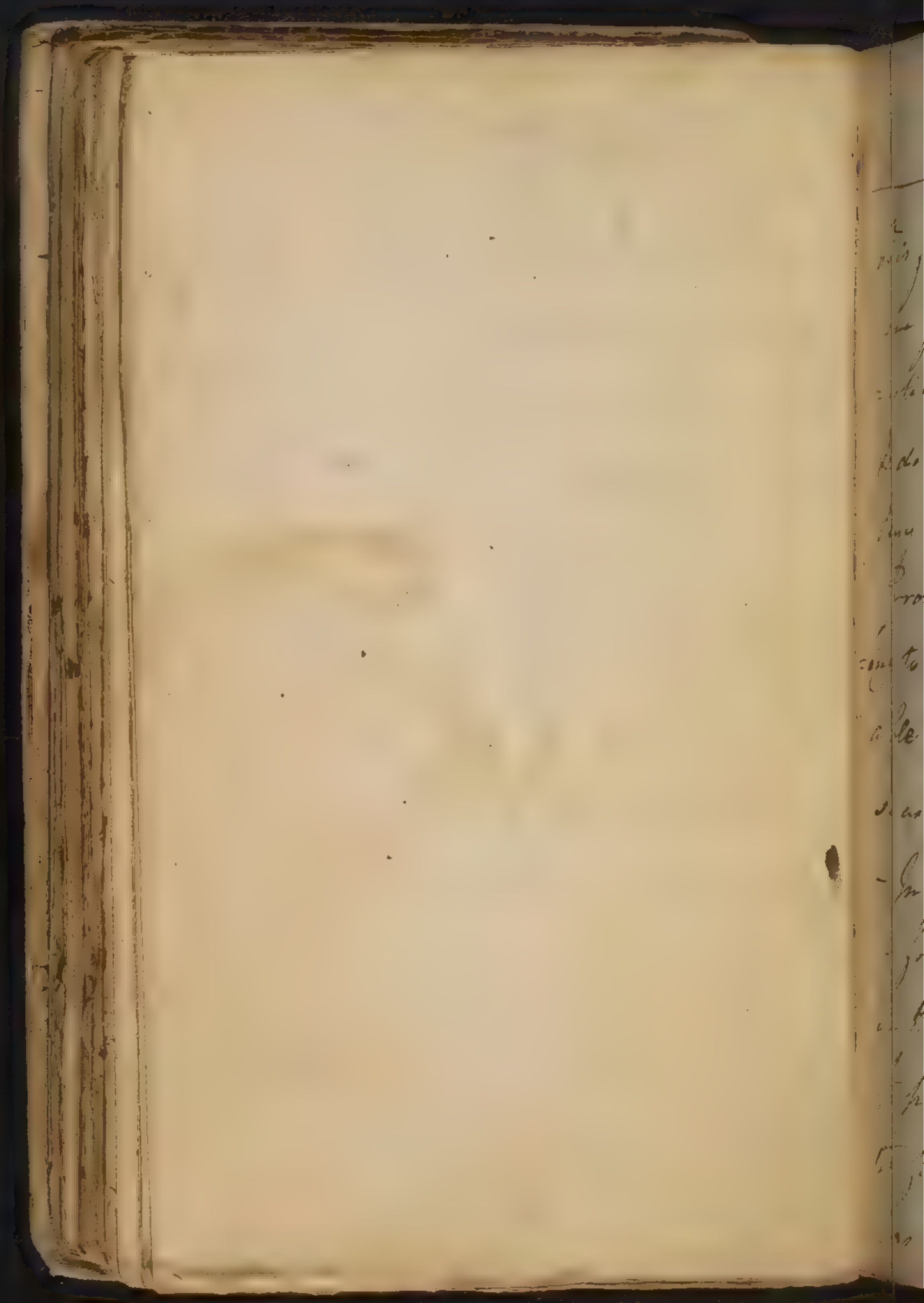




## Nutrition

is in the state of an Alkaline Earth  
 & dissolves into a Neutral salt by  
 acids. we have no matter in  $\frac{1}{2}$  soft  
 parts analogous to this. This Organic mat-  
 ter is deposited in separate cells of  
 the cellular texture & may be washed  
 out from them before it becomes so hard  
 as to obliterate the cellular texture.

see Dr. Haller on this subject who has  
 fully proved a Pusculus Osseus. the only  
 Question  $\frac{1}{2}$  now remains is how it is  
 formed? - the red vessels we speak of tend  
 1<sup>st</sup> to give a due extension to  $\frac{1}{2}$  Bones  
 & 2<sup>nd</sup> to pour forth the secreted Osseous  
 matter into  $\frac{1}{2}$  Cellular membrane

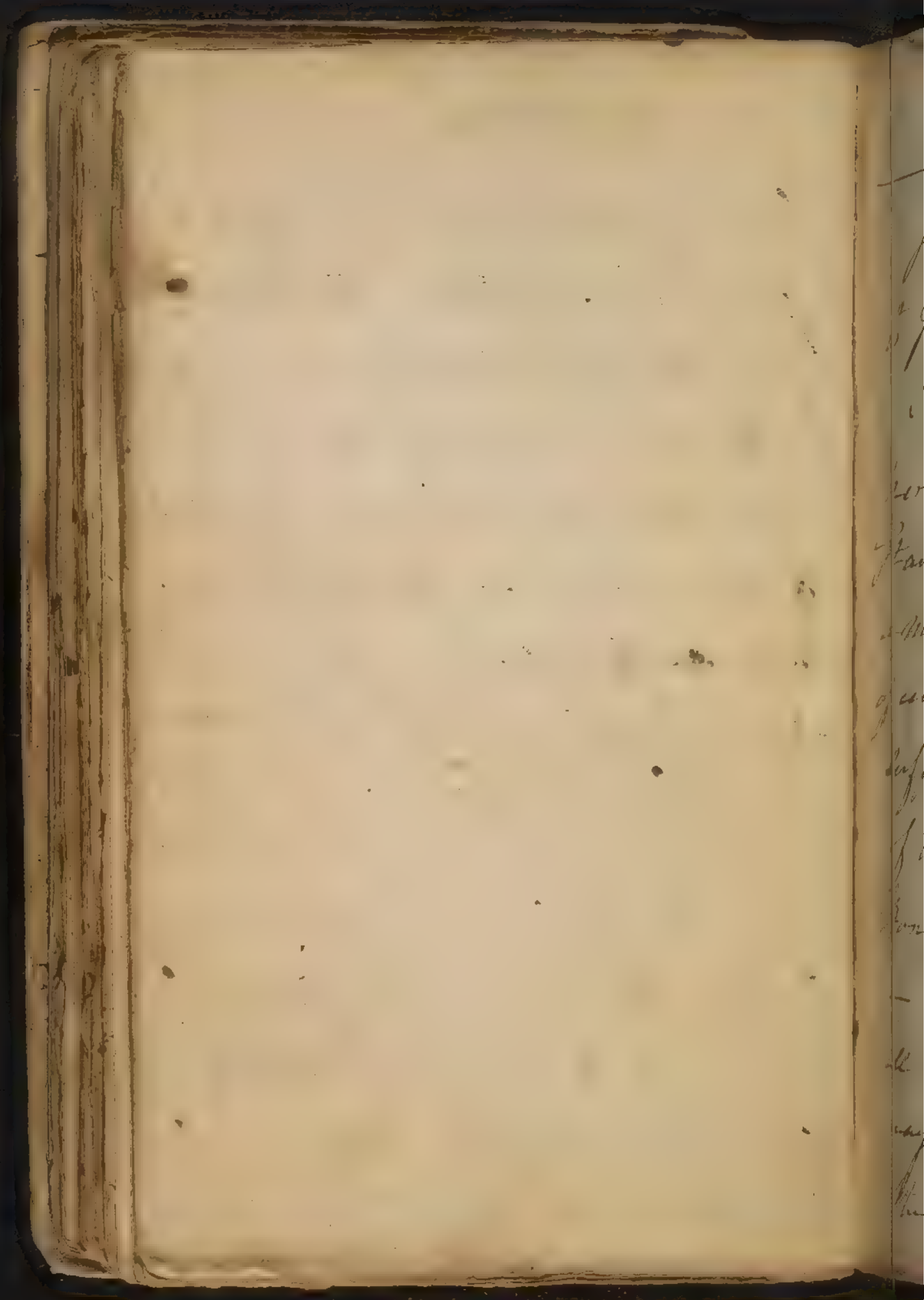


is formed on nervous Fibres. Calluses  
are formed from an Extension of the Peri-  
osteum & are evidently organized parts,  
& do not depend upon a mere Effusion of  
loose matter. The Reason then why  
Growth ceases at a certain Age is owing  
to the Force of the Heart no longer being  
able to propel the Blood in the Bones  
so as to cause <sup>them</sup> to send forth Limes.  
- In all Cases of wounds where new Flesh  
is formed a Inflammation must be excited  
in the nerves so as to cause them  
to pour out more Nutritious matter  
to fill up the cellular Texture <sup>4</sup> w:  
has been produced. This cellular Sub:  
stance



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is formed by the nerves <sup>in</sup> infer from  
its great Sensibility. The Extensile  
power then of the heart makes way  
for the nerves to pour out & to form  
this cellular membrane. This cellular  
substance may be so involved <sup>the</sup> in new  
matter ~~as~~ that its Sensibility may be  
destroyed unless an Inflamm<sup>n</sup> is induced  
upon it by certain Causes. The heart  
does not increase in proportion to  $\frac{1}{2}$  part  
of the System, & hence our Growth is  
limited. The substance of the Bones be-  
comes hard by age so as to obstruct  
the blood vessels they contain. Hence  
a Resistance is produced to the Heart.





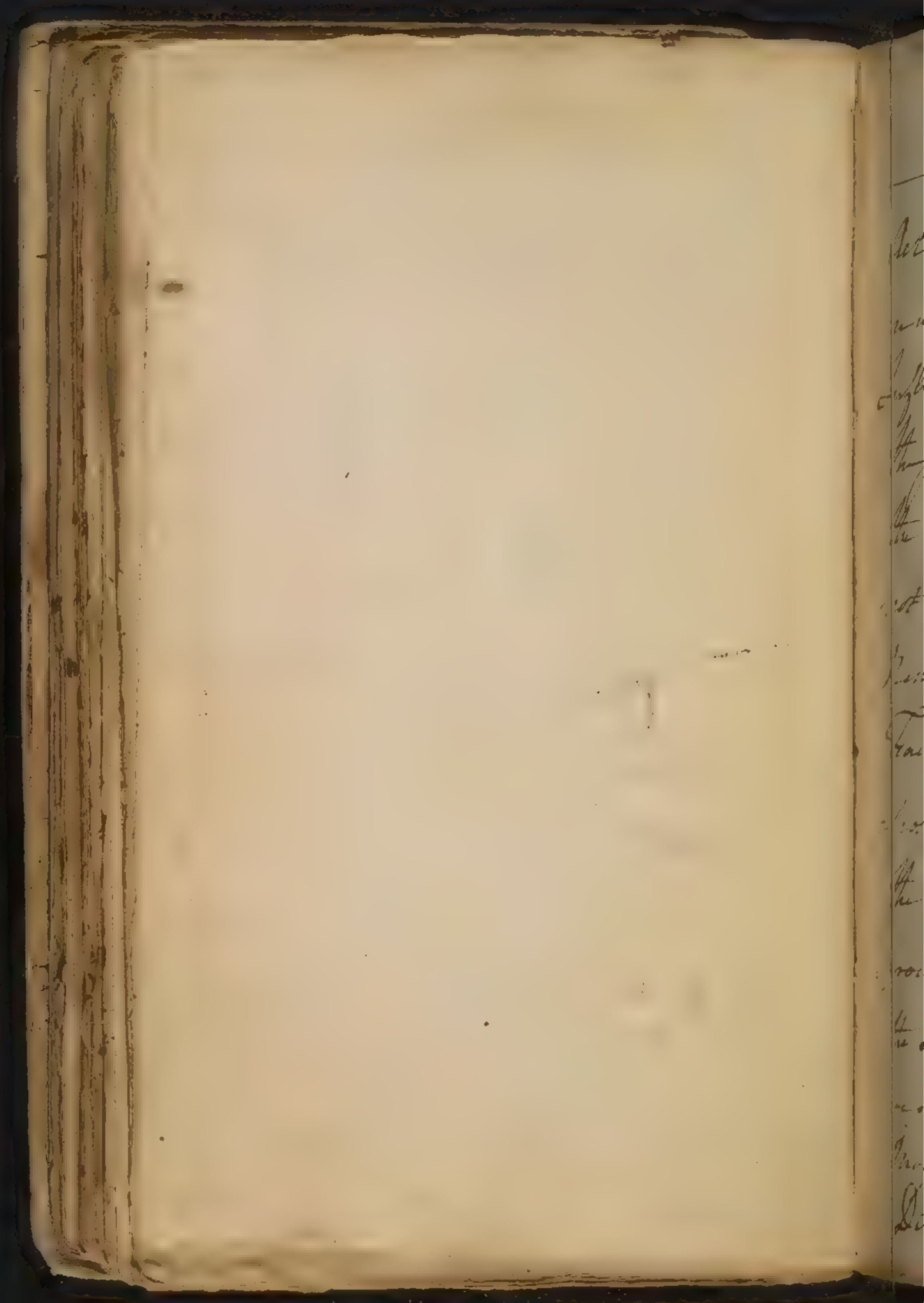
# Nutrition

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I shall now briefly recapitulate  
w<sup>h</sup> I have said of Nutrition.

In every part of the Body there are  
Nervous Fibres <sup>in</sup> the Original  
Stamina of the Body but formed in such  
a manner as to admit of an action  
of cellular Membrane. This I think  
sufficiently proved 1<sup>o</sup> from <sup>2</sup> Analogy  
of vegetables 2<sup>o</sup> from <sup>2</sup> formation of  
Bones & 3<sup>o</sup> from the Production of Callus.

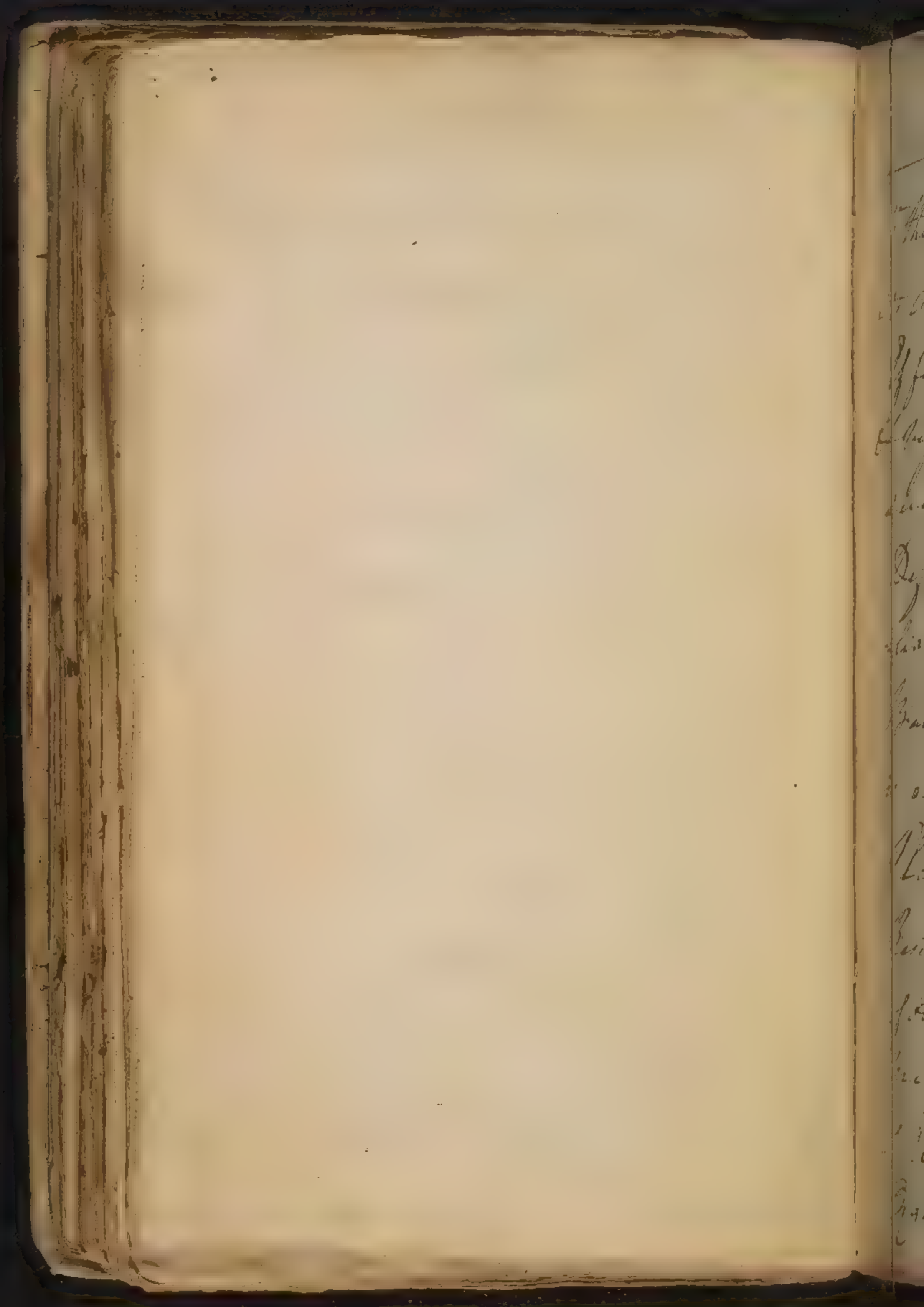
— I do not pretend from this to explain  
all the Phenomena of Nutrition. These  
may follow afterwards. The Growth of  
the Body I said depends upon the



## Nutrition

Action of the Heart, but to this we must add <sup>ca</sup> Corruption w. has some Influence in determining the Form of the Solids. I do not pretend to say why the Force of the Heart Action does not encrease in proportion to the Rest of the Body. we are sure of the Fact, & this is sufficient for our purpose. Growth is always greatest in the Beginning & least as it <sup>not</sup> approaches towards its Acme. It is uniformly the same in all parts of the Body w. we said depends upon some vessels being more lax & patent than others. This Disproportion is most manifest in





## Evolution.

<sup>in</sup> The head <sup>is</sup> we see first arrives at  
 its name. Hence the reason why the  
 Effects of a Disproportion between the Fluids  
 & Solids so often appear in <sup>the</sup> Head  
 such as Hemorrhages - Nervous  
 Affections &c. <sup>is</sup> are always pecu-  
 -liar to young children. When the  
 Balance of between the Fluids & Solids  
 is established we find the Effects of  
 Plethora in the Lungs where the  
 Resistance is least hence <sup>the</sup> frequency  
 of hemorrhages from them in young  
 men. The last Effect of the power  
 of Evolution is to form <sup>+ 333 + 2</sup> Genital  
 Organs <sup>or</sup> we give a due Balance

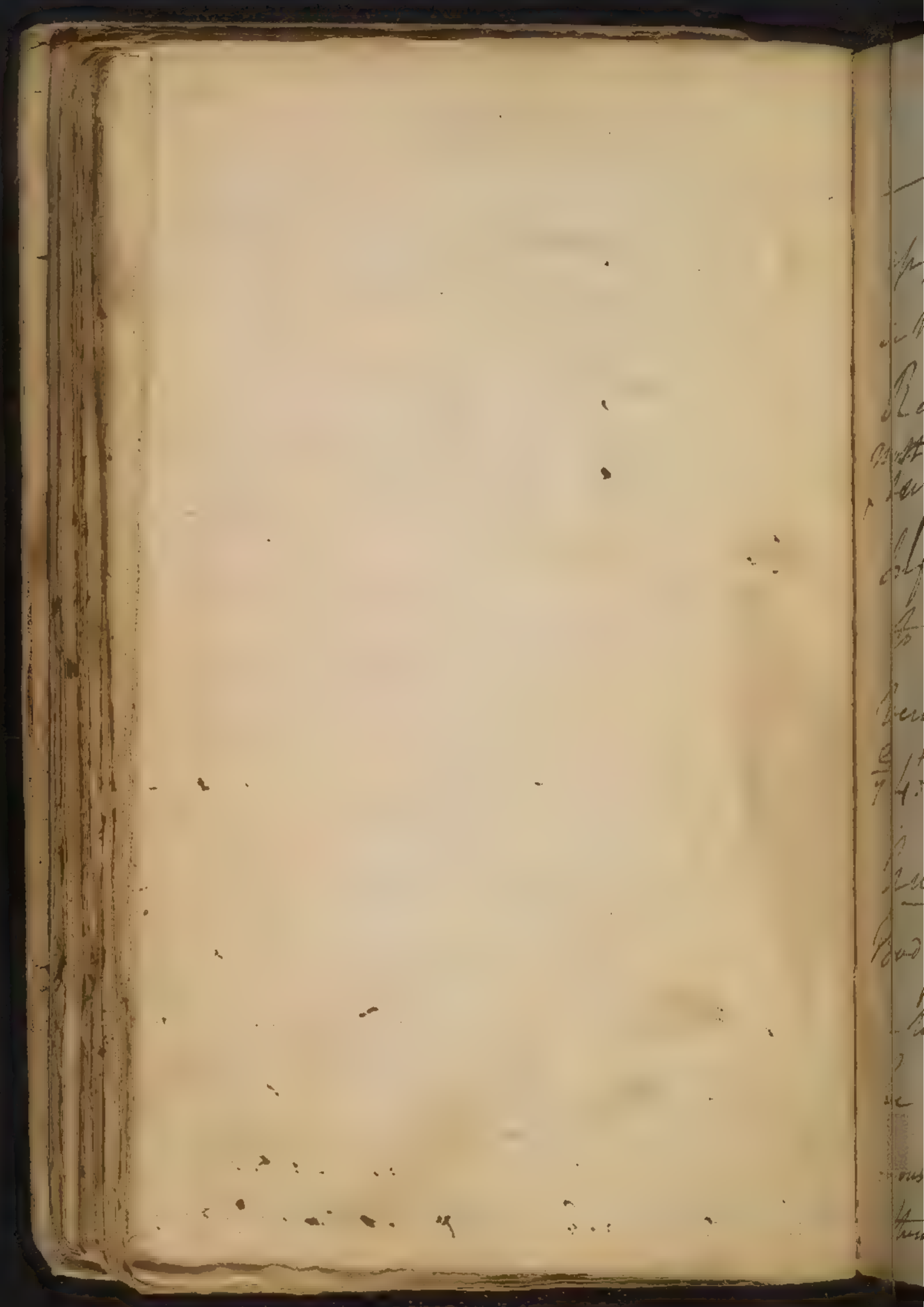
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## Nutrition

To the Arteries & Nervous System.  
 — a want of this evolution tends to  
 weaken the Force of the System.

There is a Distinction, the Menstrus  
 is often attended w<sup>th</sup> Atonia than  
 w<sup>th</sup> Plethora. a Gallane is likewise  
 formed when the body arrives at  
 its growth between the Arteries & Veins.  
 — if the Veins or Excretories receive the  
 Arterious Blood w<sup>th</sup> too much Facility  
 we sh<sup>d</sup> see no Growth, but at 4:  
 years the Resistance of the Veins is taken  
 off, the Density of the Arteries be-  
 ing increased by the Accumulation  
 of the Blood, & the Plethora then



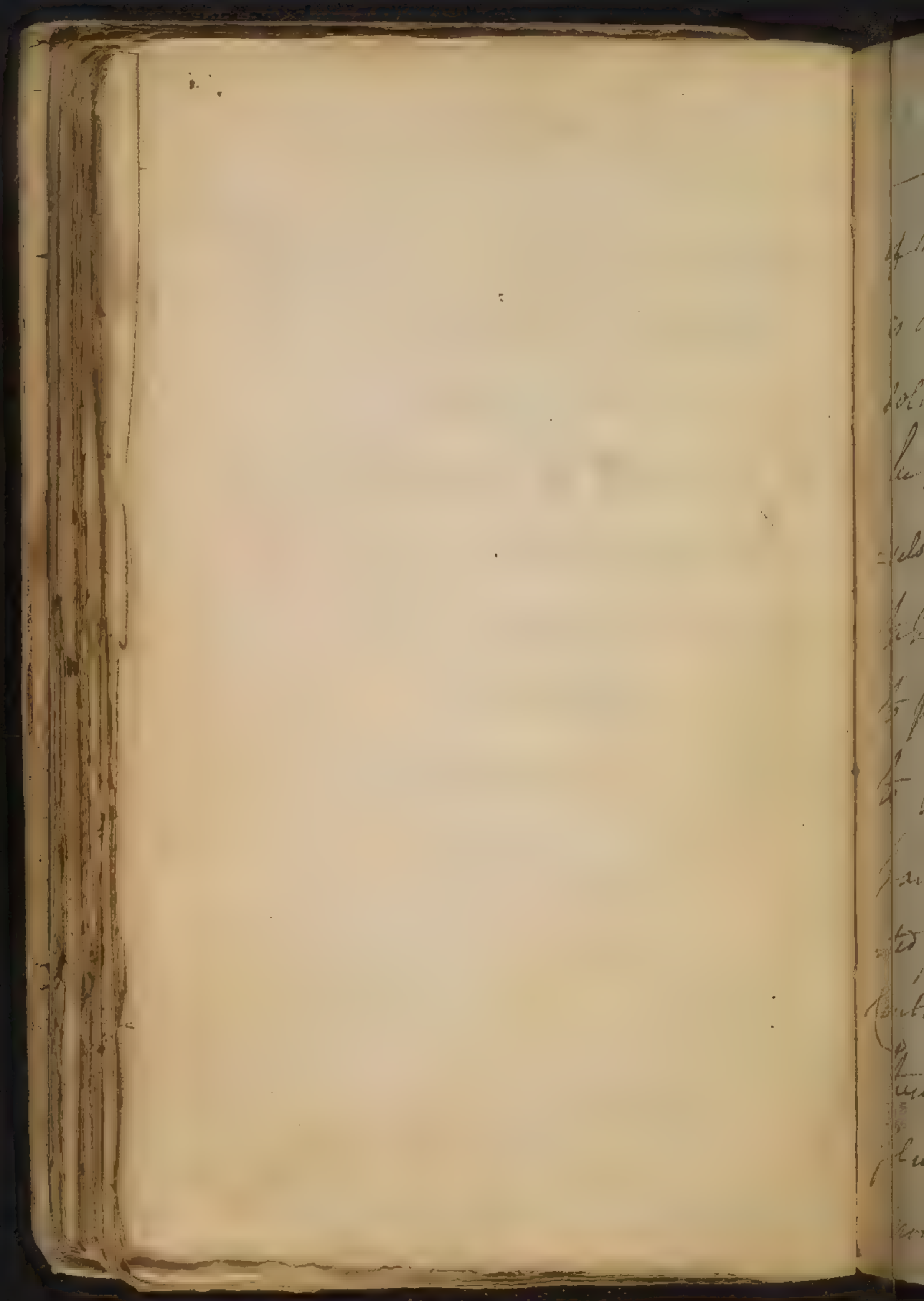
## Nutrition

appears no longer in the Arteries but  
in the veins. Hence you see the  
Reason why young men are  
most  
subject to External Hemorrhages and  
Inflammatory Diseases & Old Men  
to all the Diseases that arise from  
Venous Stagnation.

2<sup>d</sup> Question occurs here how is  
Nutrition performed after the  
Body arrives at its growth?

- To this I answer that there may  
be Excretion & solution of the Calca-  
rious Matter of the Bones <sup>ch</sup> & disposal  
them to be absorbed & so carried out.

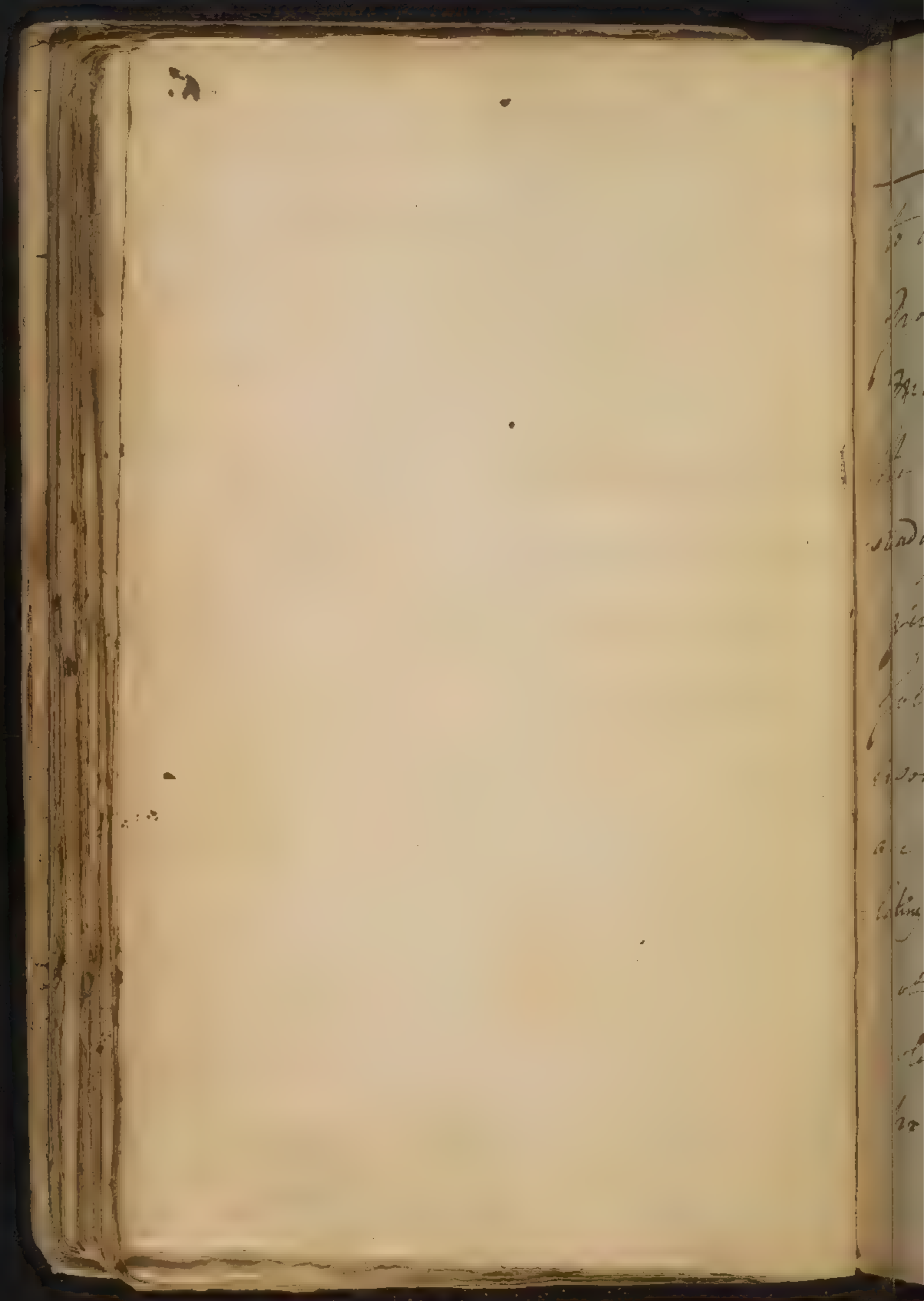




## Nutrition

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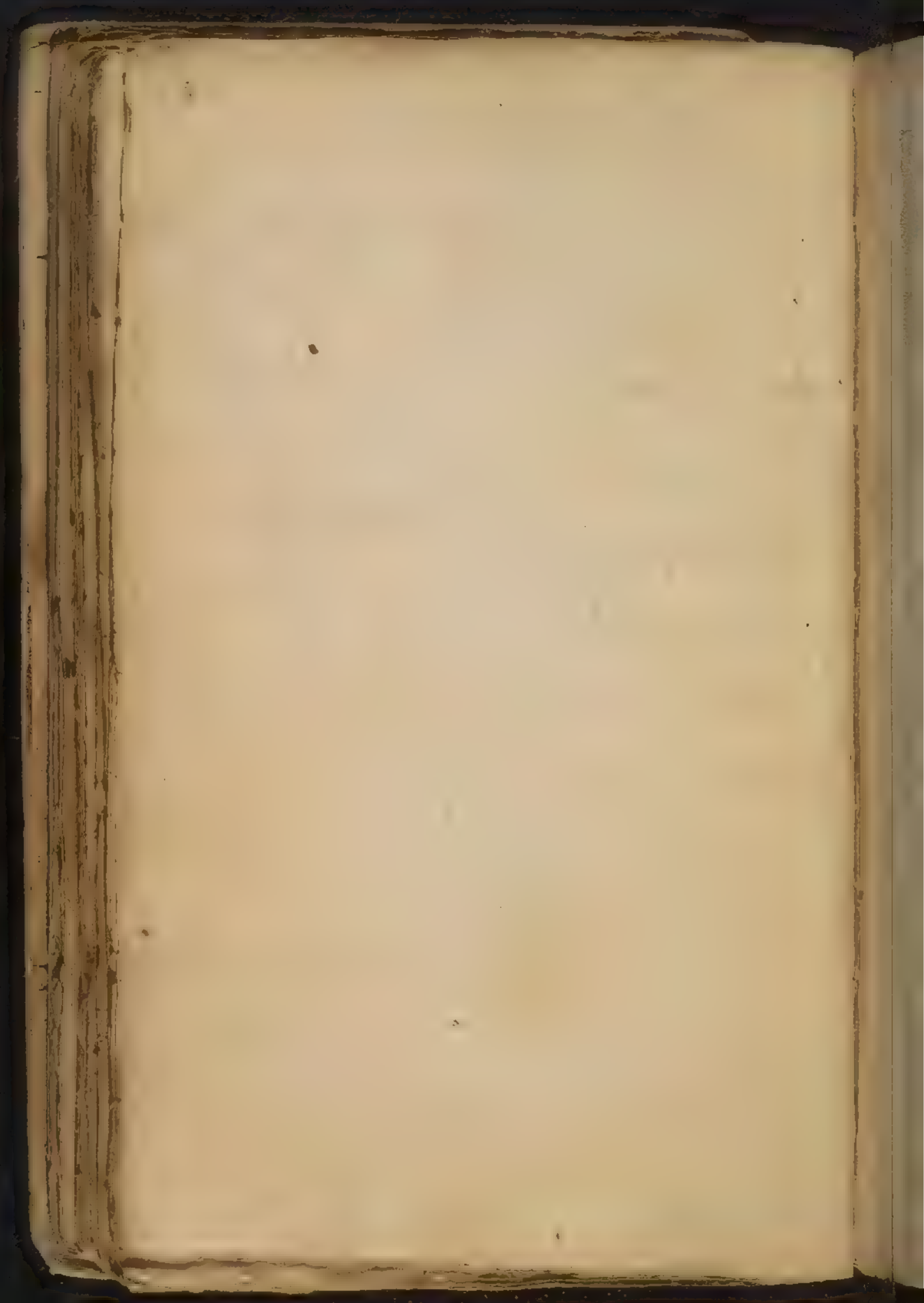
of the system. Attrition however  
 is constantly wearing away the  
 solid matter of our bodies. This can  
 be performed only in the largest  
 vessels, but we have no proof of its  
 taking place. The blood is applied  
 to polished surfaces <sup>ch</sup> w: are not liable  
 to abrasion. The surface of every  
 part of the body is provided with <sup>the</sup> ~~wide~~  
 net veins <sup>ch</sup> w: prevent the immediate  
 contact of the fluids <sup>ch</sup> w: pass thro  
 them. Nor can I admit fusion or  
 solution taking place except in  
 morbid cases which bring us back





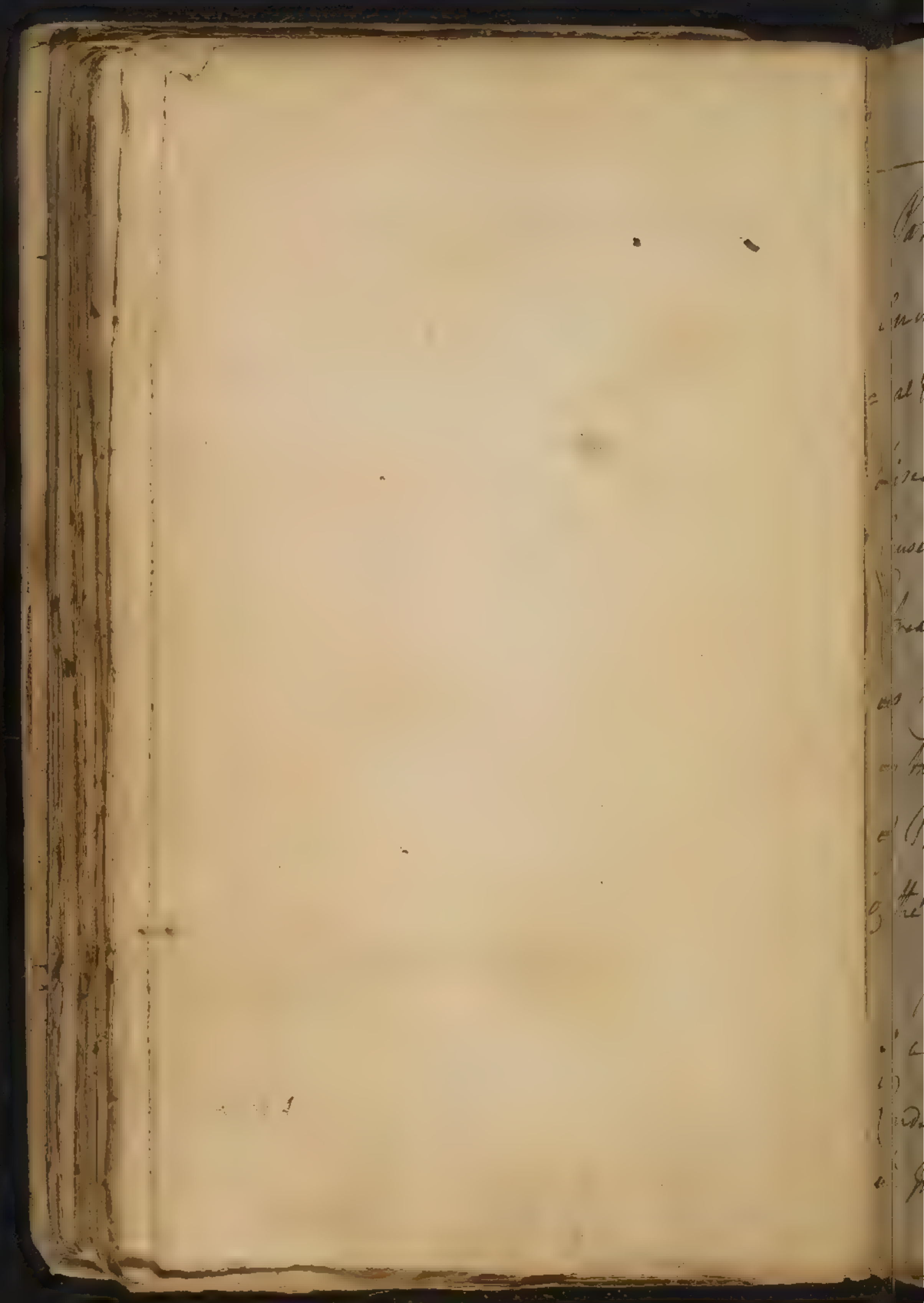
## Nutrition

to our former list of the Causes of the  
Growth of the Body. The Nutritious  
Matter then when applied after  
the Body arrives at its Acme in-  
stead of giving greater ~~and~~ Extension  
gives greater Density, hence the  
Solids are always growing harder  
inasmuch that in extreme old Age they  
are no longer patentous to the ~~old~~ Circu-  
lating Blood. This Gentlemen finishes  
not only Nutrition but our Physi-  
ology in general. we shall next  
proceed to the Pathology.



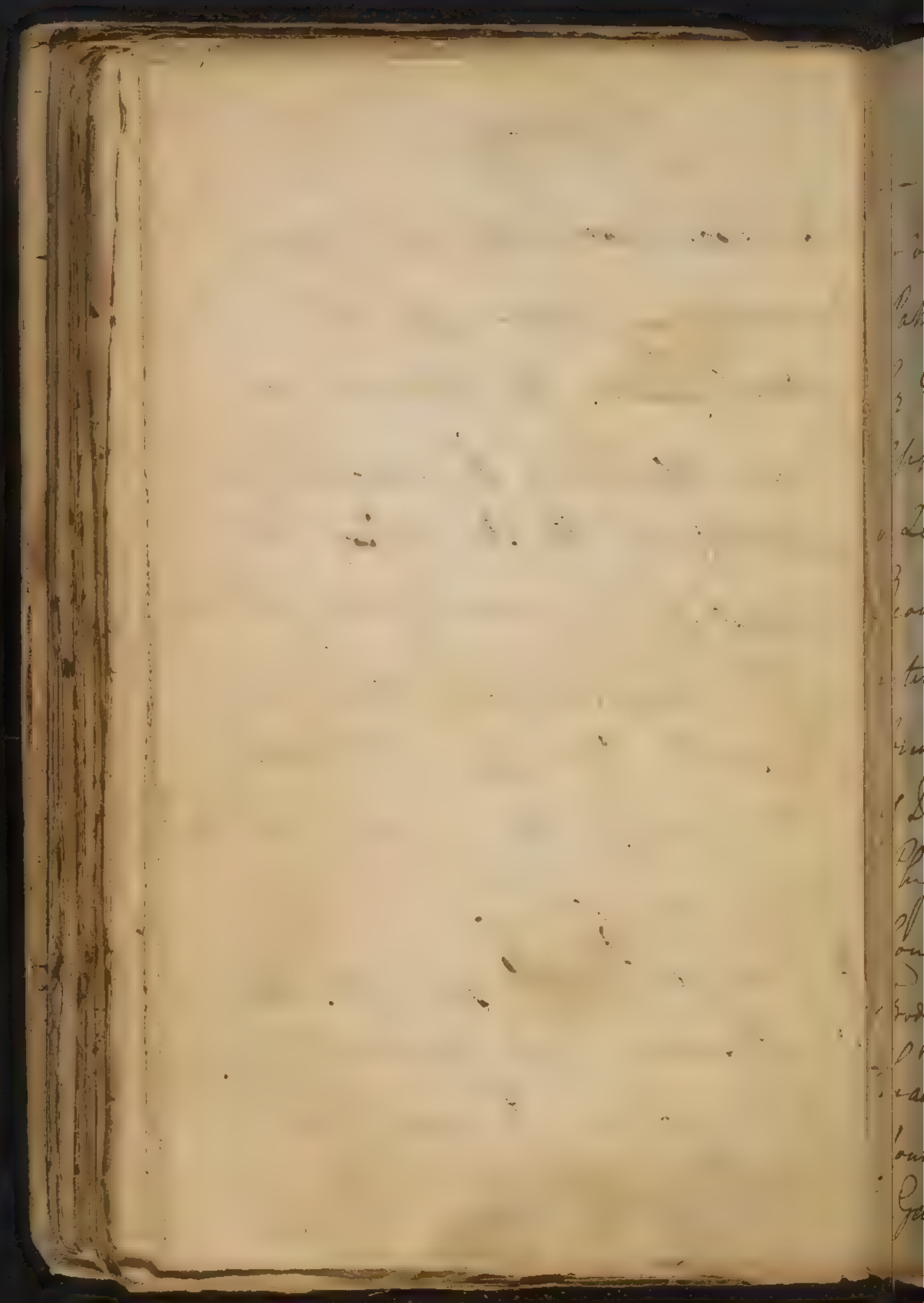






Pathology treats of the morbid state of the Animal Body. It is of two kinds: General & Special. The first treats of Diseases Abstractly by investigating their Causes & Effects. The second is that <sup>ch</sup> w: treats of the Causes & Effects of Diseases as they occur in particular Persons. so that the first gives the Pathology of Physiology, the second <sup>2</sup> Pathology of the Practice of Physic.

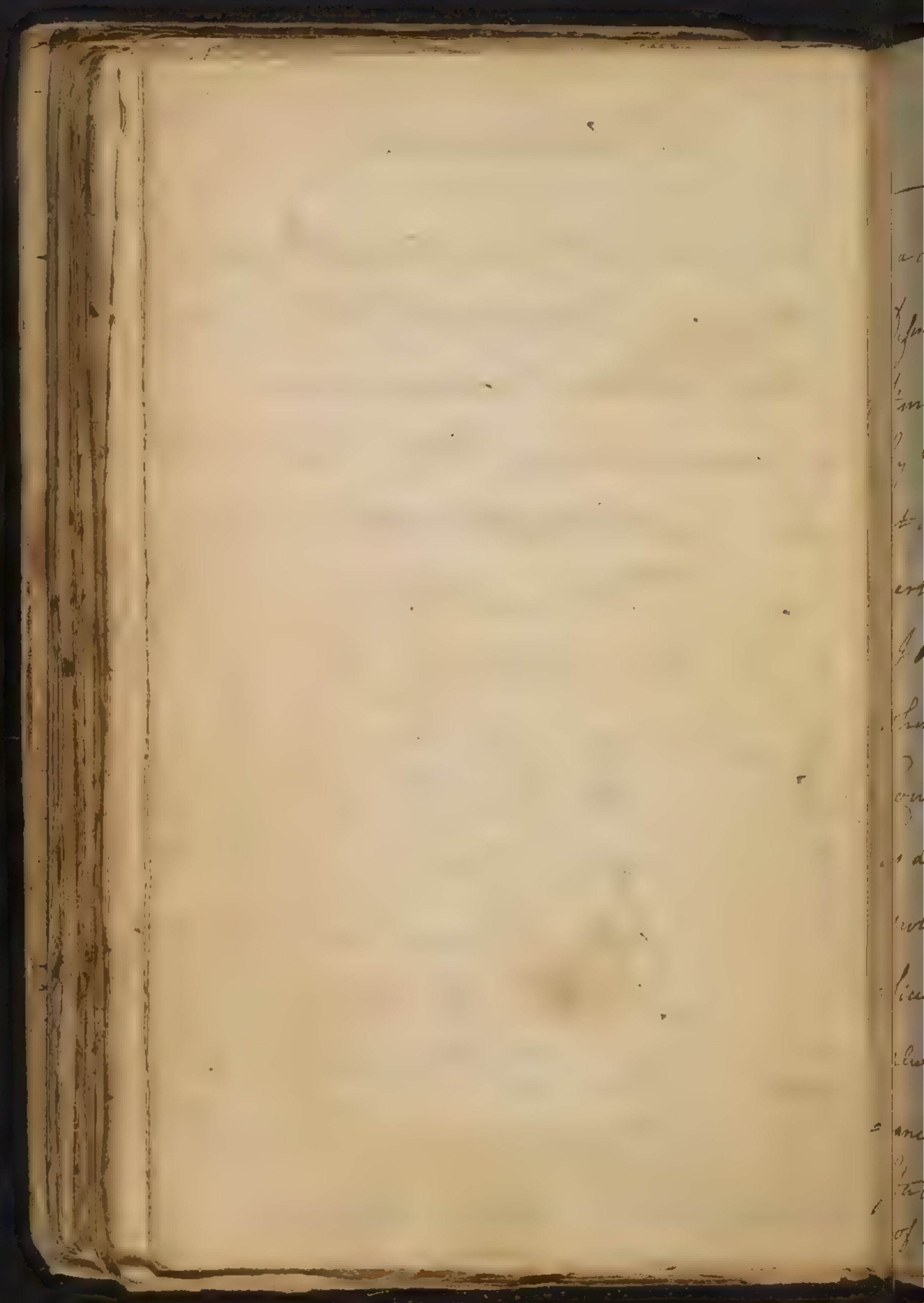
I shall begin by giving a Definition of a Disease by <sup>ch</sup> w: I understand that Condition of an Animal Body in <sup>ch</sup> w: its Functions are not performed at all





## a Disease what?

or very imperfectly. see § 34 of Dr Gaubius's Pathology. a Disease has been considered by Physicians in two ways 1<sup>st</sup> as an Apparent - manifest Interruption or Lesion of the Actions of the human Economy w<sup>th</sup>out any Regard to the internal state of that Body. This is the view which common People have of Disease. The 2<sup>nd</sup> way <sup>which is peculiar to Physicians</sup> (w<sup>ch</sup> is peculiar to Physicians) of considering it is <sup>a Disease is</sup> that Condition of the internal parts of the Body w<sup>ch</sup> is unfit to perform its ordinary healthy Actions. w<sup>ch</sup> Condition is to be found out by Reasonings. This is Dr Gaubius's Definition of a Disease.





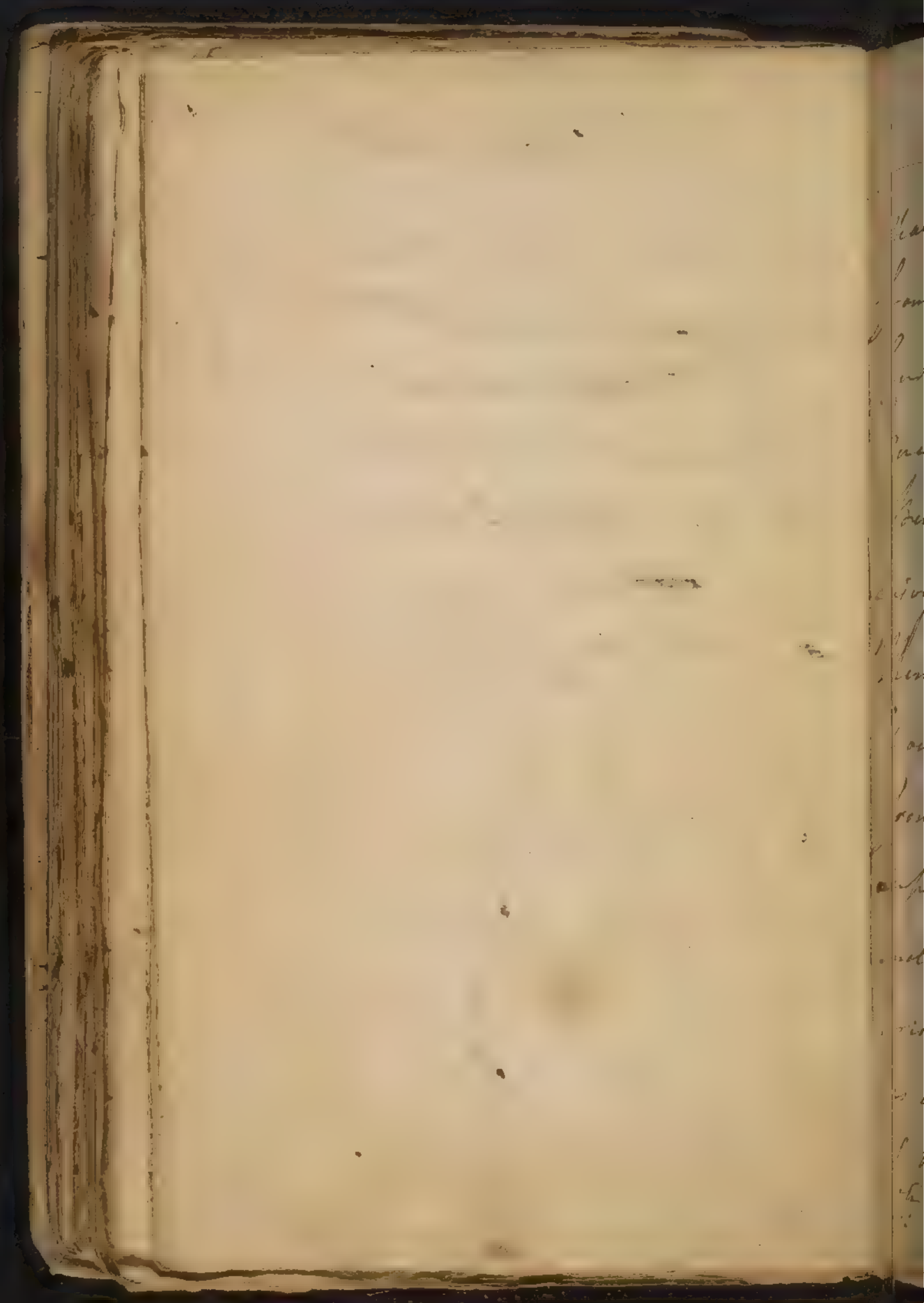
a Disease what?

289

a Question arises here & y<sup>t</sup> is w<sup>ch</sup> of these Definitions shall we admit? For a long time the i<sup>o</sup> of them was only employed by Physicians, and indeed we arrive at our Knowledge of Diseases only by certain ~~of~~ external appearances.

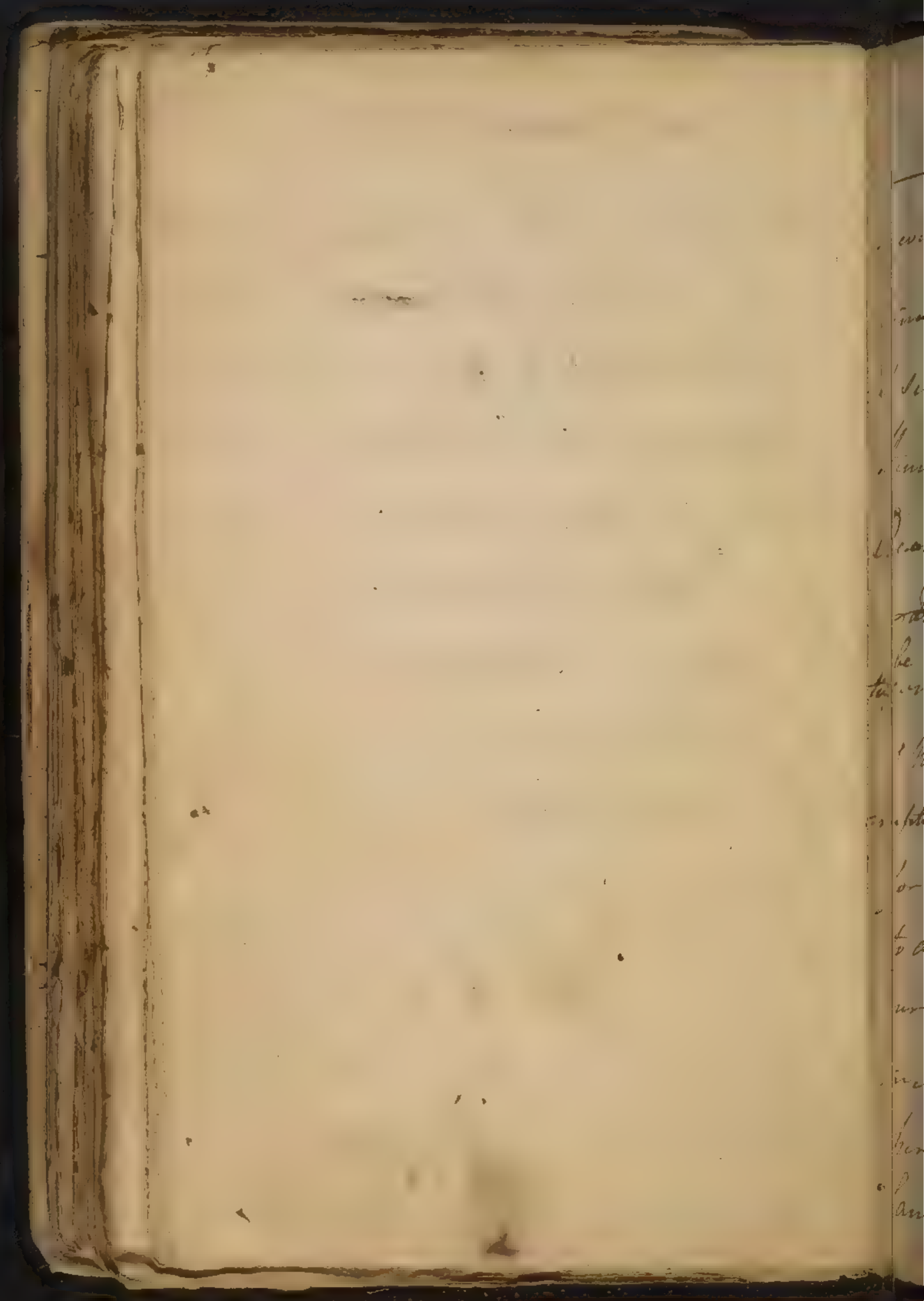
I adopt therefore the Definition I gave <sup>that is the i<sup>o</sup> of these Distinctions</sup> when I set out, viz: that it is that Condition of the Body in w<sup>ch</sup> (I not by w<sup>ch</sup> as Dr. Gaubius has it) its Actions are not <sup>at</sup> all performed or performed w<sup>th</sup> Difficulty. Our chief Regard then must always be paid to ~~the~~ external appearances without any Attention to the internal State of the Body in forming our Judgm<sup>t</sup> of the Presence of a Disease. But how





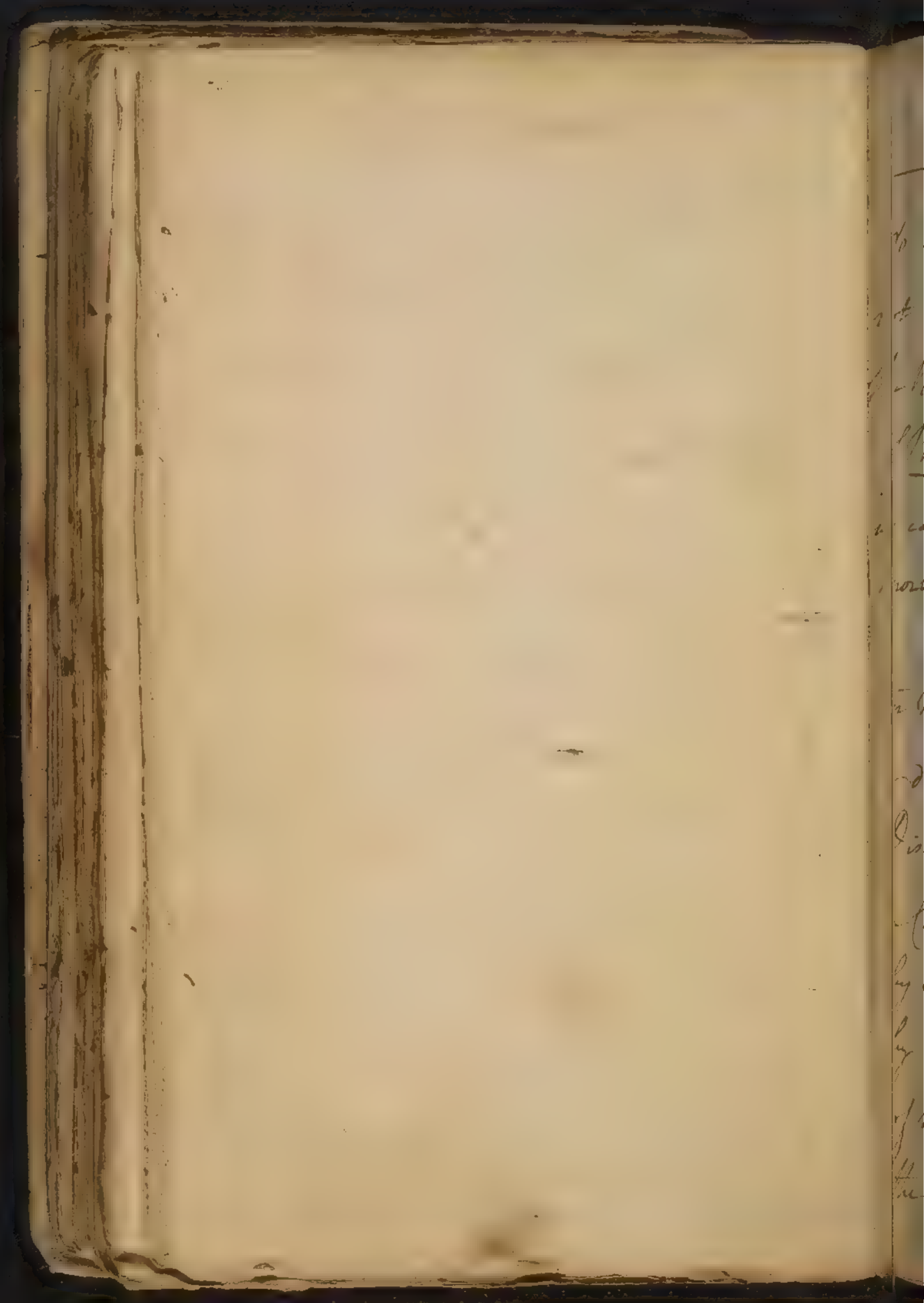
shall we know when the Body deviates  
from its healthy state? ~~since~~ every Person's  
Constitutions differ & w<sup>h</sup> is Health in  
one man would be Disease in another.

Besides I believe few men in the world  
enjoy uninterrupted Health. we must  
then allow a "Latitudo Sanitatis"  
& our judgment of Diseases must be deduced  
from a medium state of the Body when  
supposed to be in Health w<sup>h</sup> must  
include the Deviations from Health w<sup>h</sup>  
arise from Age Sex & Temperament,  
as also the Imperfections in the Exercise  
of the Functions in particular Persons  
w<sup>h</sup> arise from Fatigue &c. therefore





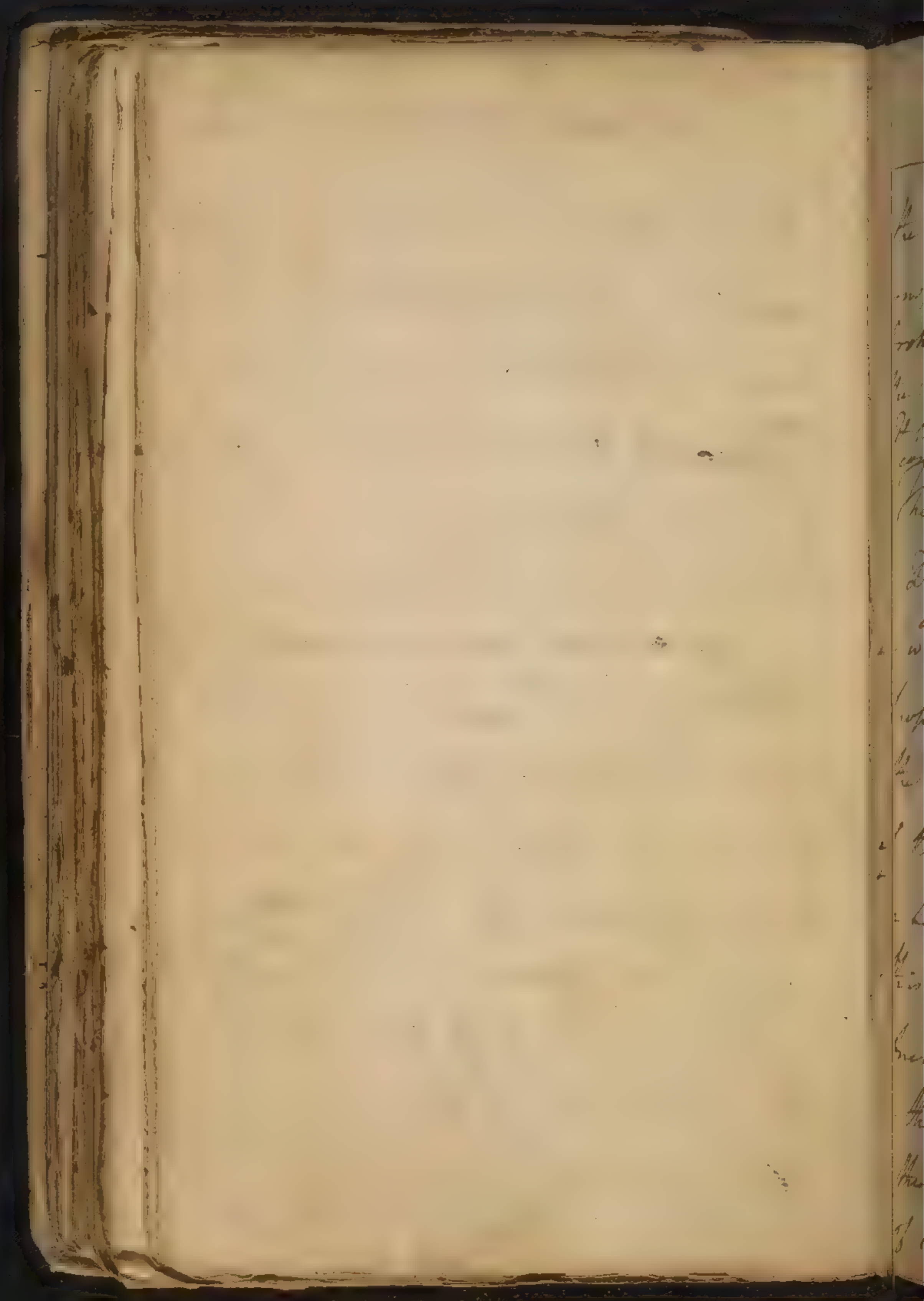
never to be considered properly and discuss  
 since no line is exempted from them,  
 & since Nature herself quickly removes  
 them by the ordinary powers of the  
 Economy. I now Repeat again:  
~~and~~ That state of the body only is  
 to <sup>be</sup> considered as a Disease when <sup>the</sup> functions  
 of the healthy ~~or~~ body are so inter-  
 rupted as to <sup>be</sup> performed w: <sup>the</sup> ~~consequence~~ <sup>inconsequence</sup>  
 for a considerable time & are obvious  
 to our senses. I must add here that  
 our notions of Disease must likewise  
 include the state of the mind. But  
 here too we must allow a *Latitudo*  
*'Sanitatis'* Physic has nothing to



do we any Diseases of the mind <sup>th</sup> do  
not depend immediately on the state of  
the body. Truly & vice are the Objects  
of Philosophy & not of Physic unless  
we can prove they arise from some  
morbid affection of the body. —

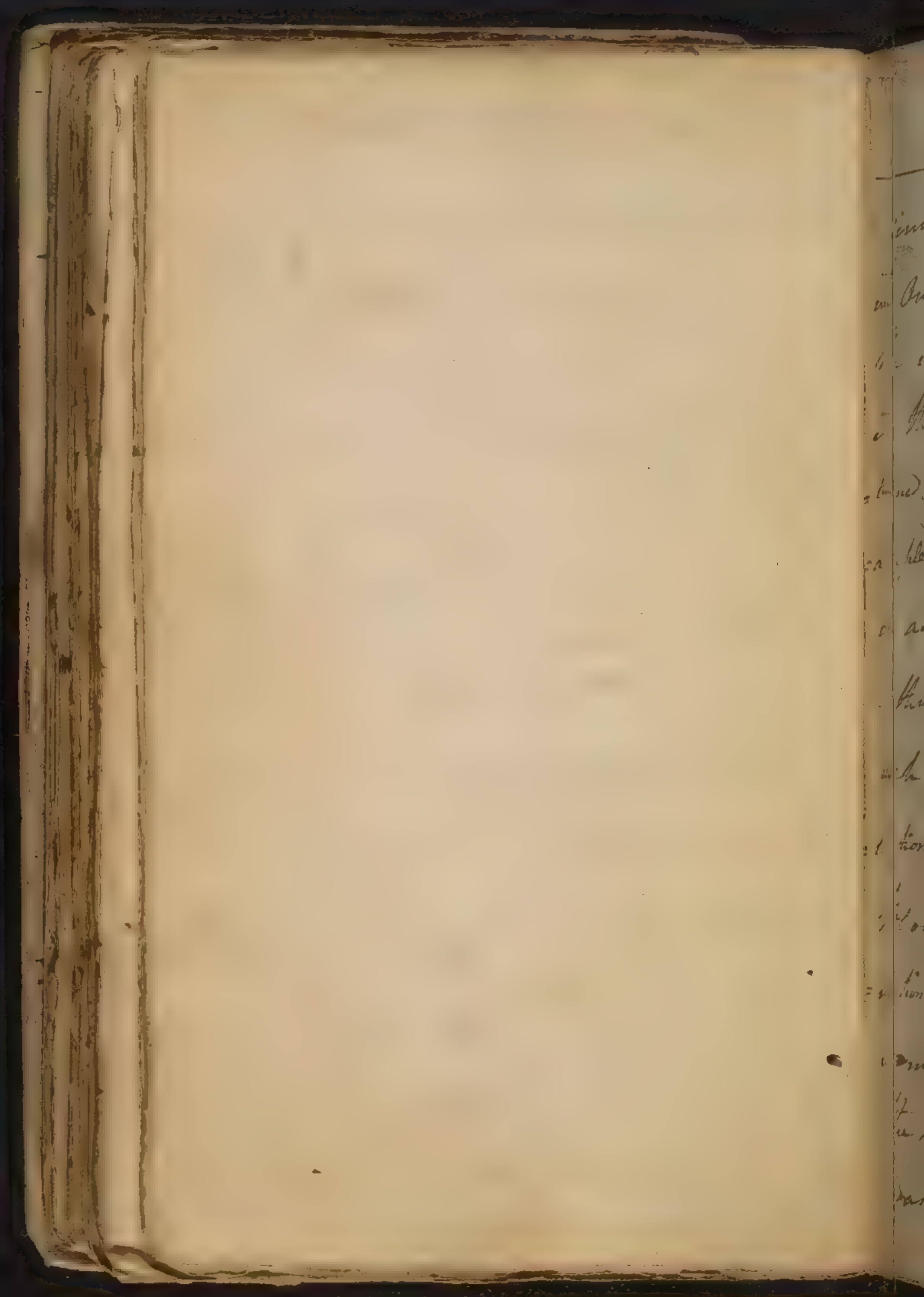
I go on now to explain the Terms  
in Pathology. Diseases are marked  
or distinguished by their Causes, for every  
Disease is an Effect <sup>ch</sup> w: depends upon  
a chain of causes. This may be illustrated  
by supposing a man in a sea fight killed  
by a splinter struck off from the side  
of the ship. the splinter here was  
the immediate or proximate Cause of





the man's death. but a chain of causes conspired to produce this such as if Ball y<sup>h</sup> broke off the splinter - the Cannon from whence the Ball came - the powder that drove it & the spark that set fire to it. all these are considered as remote causes.

The immediate or proximate Cause of a Disease is that state of the body in w<sup>h</sup> the Functions cannot be performed properly or w<sup>th</sup> ease. Thus in a Rheumatism the proximate Cause is the Over Distention of the vessels of the part affected. but a series of causes conspire to produce this one such as Obstruction - an Increased Action of the blood vessels - the Operation of cold & the like. all these last causes are distinguished by name of Remote. Remote causes are seldom

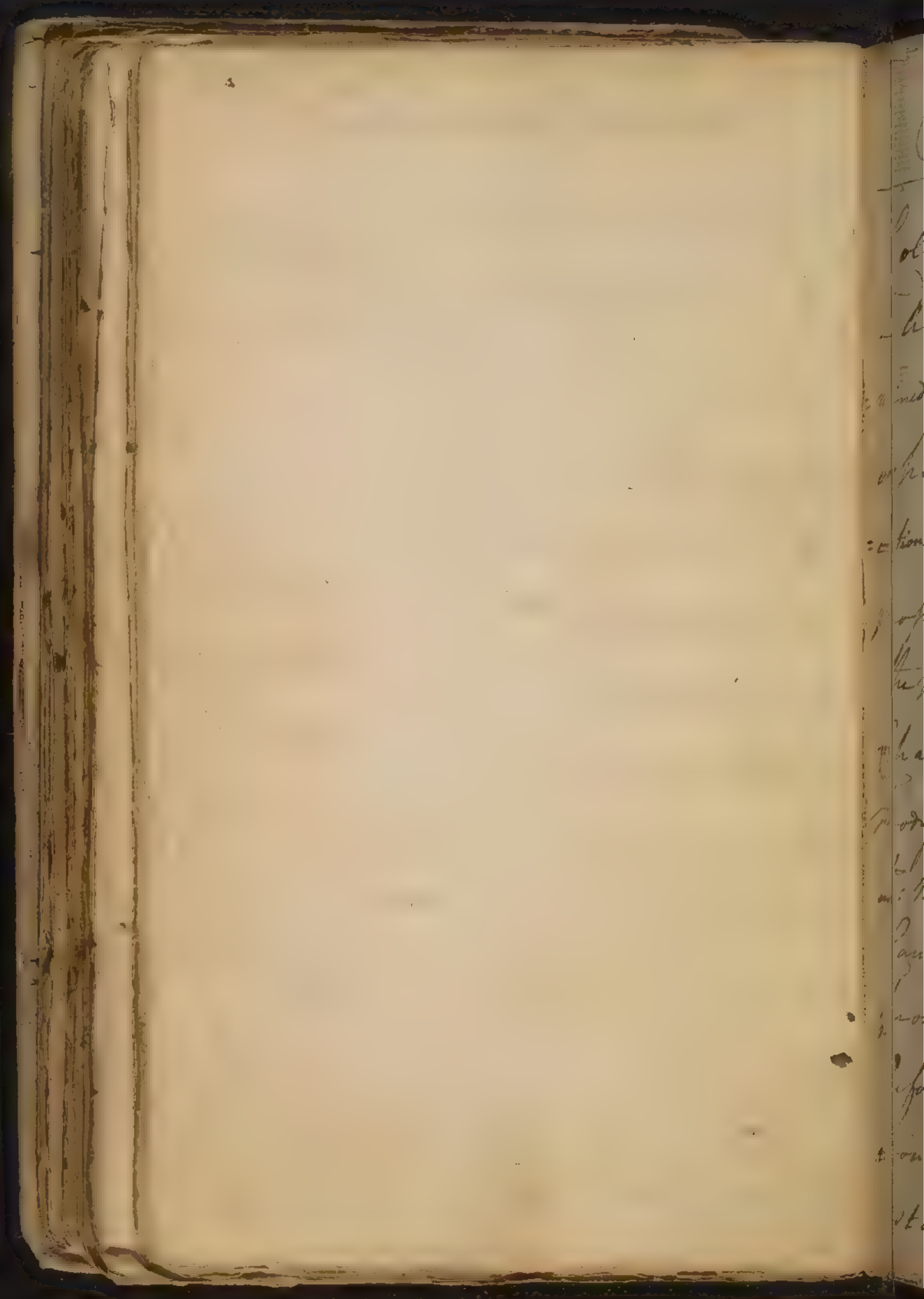




## Causes of Diseases what?

294

simple, but mostly act in conjunction  
w: One Another. Thus the Absorption &  
the increased Action of the Blood Vessels  
in the Rheumatism are always com-  
bined together. Let us take Another Ex-  
ample: The proximate Cause of an Ascites  
is an Accumulation of water in <sup>the</sup> Abdomen.  
This Accumulation is owing to <sup>the</sup> vessels  
exhaling too much Lymph. This Exha-  
lation may be owing to a Stagnation of  
Blood in the Vena portarum, this stag-  
nation may be owing to a Suppression of  
some usual Evacuation such as  
the Haemorrhoidal Flux <sup>or</sup> Suppression  
was occasioned by the Application of cold

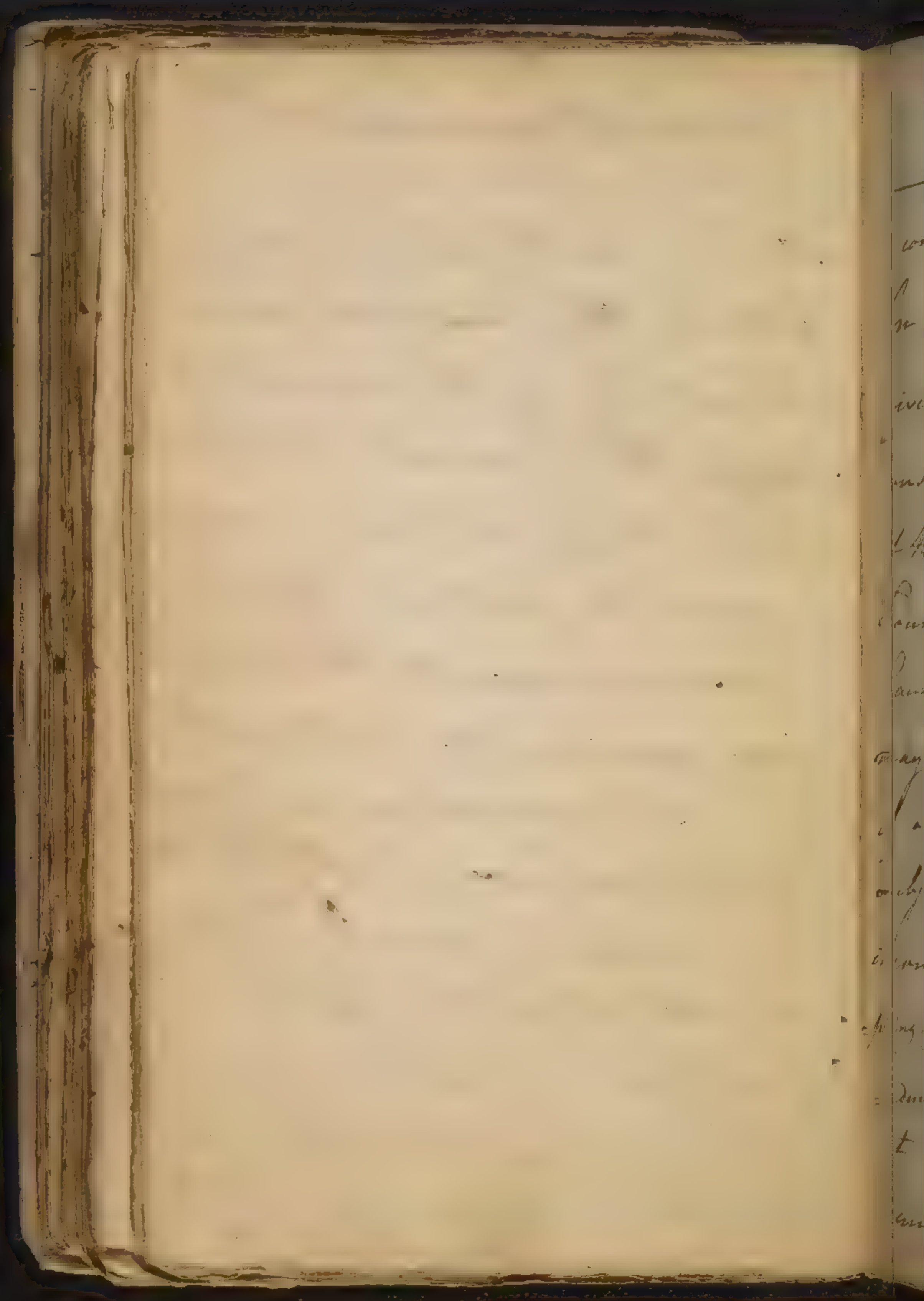


## Causes of Diseases what?

295

Cold here was the only remote cause.  
- All the other causes are so combined that they are to be considered as parts of the proximate. Our indications of cure therefore in Diseases is always proportioned to the nature or number of the proximate causes. so that every change you see induced upon the Body is to be considered as connected with the proximate cause. Even the Remote cause is sometimes connected with the proximate. thus if the splinter we before spoke of continues in an wounded part so as to keep up a constant Irritation it is then to be

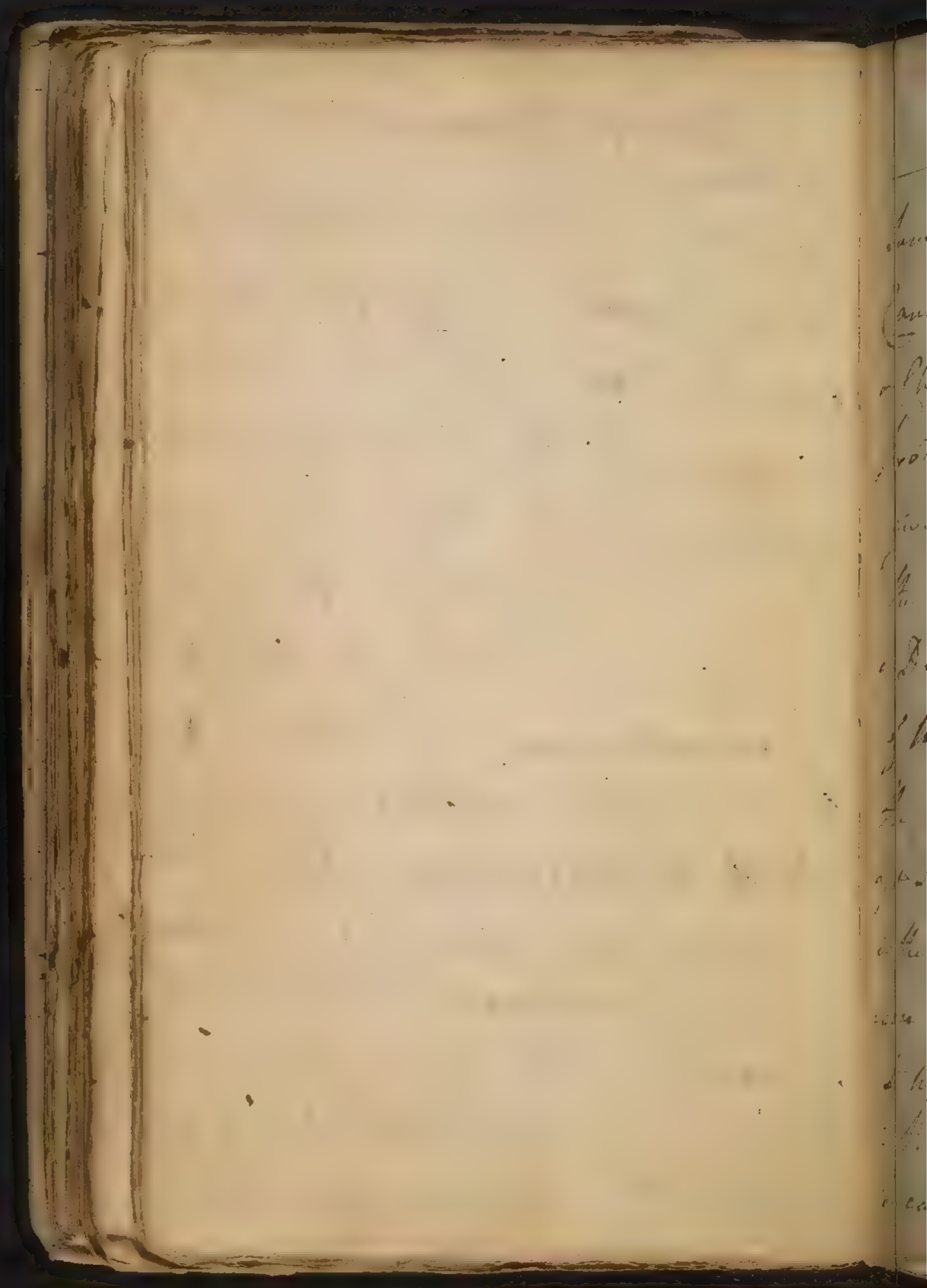




## Causes of Diseases what?

considered as the proximate Cause of it.

In a word then every Cause that gives Rise to an Indication is to be considered as part of the Proximate, & those as Remote <sup>ch</sup> w: do not give any Foundation to Indications. Predisposing Causes (of <sup>ch</sup> we shall speak hereafter) may sometimes act as proximate. Thus if a Man from a plethoric state is subject to Hemorrhages, this Plethora is considered generally only as a predisposing Cause but I think it should be considered as part of the proximate Cause as it requires an Indication of Cure to remove it. proximate Causes have





Causes of Diseases What? 297

Sometimes been called Continant  
Causes as comprehending all the series  
or chain of causes <sup>ch</sup> w<sup>ch</sup> conspire to  
produce the Disease. This certainly  
gives us the most distinct view of  
the nature of the proximate Cause of  
a Disease. See a Dr Boerhaave's definition  
of the proximate Cause w<sup>ch</sup> I think by far  
the most unexceptionable <sup>ble</sup> of any I have  
yet seen § 740. the Causa proxima  
is the only true physical Cause of a Dis-  
ease see Dr Cullen's § 61. & § 74. According  
to Woffius the proximate Cause of a Disease  
is that Cause upon w<sup>ch</sup> the actuality (as  
he calls it) of a Disease depends. all the

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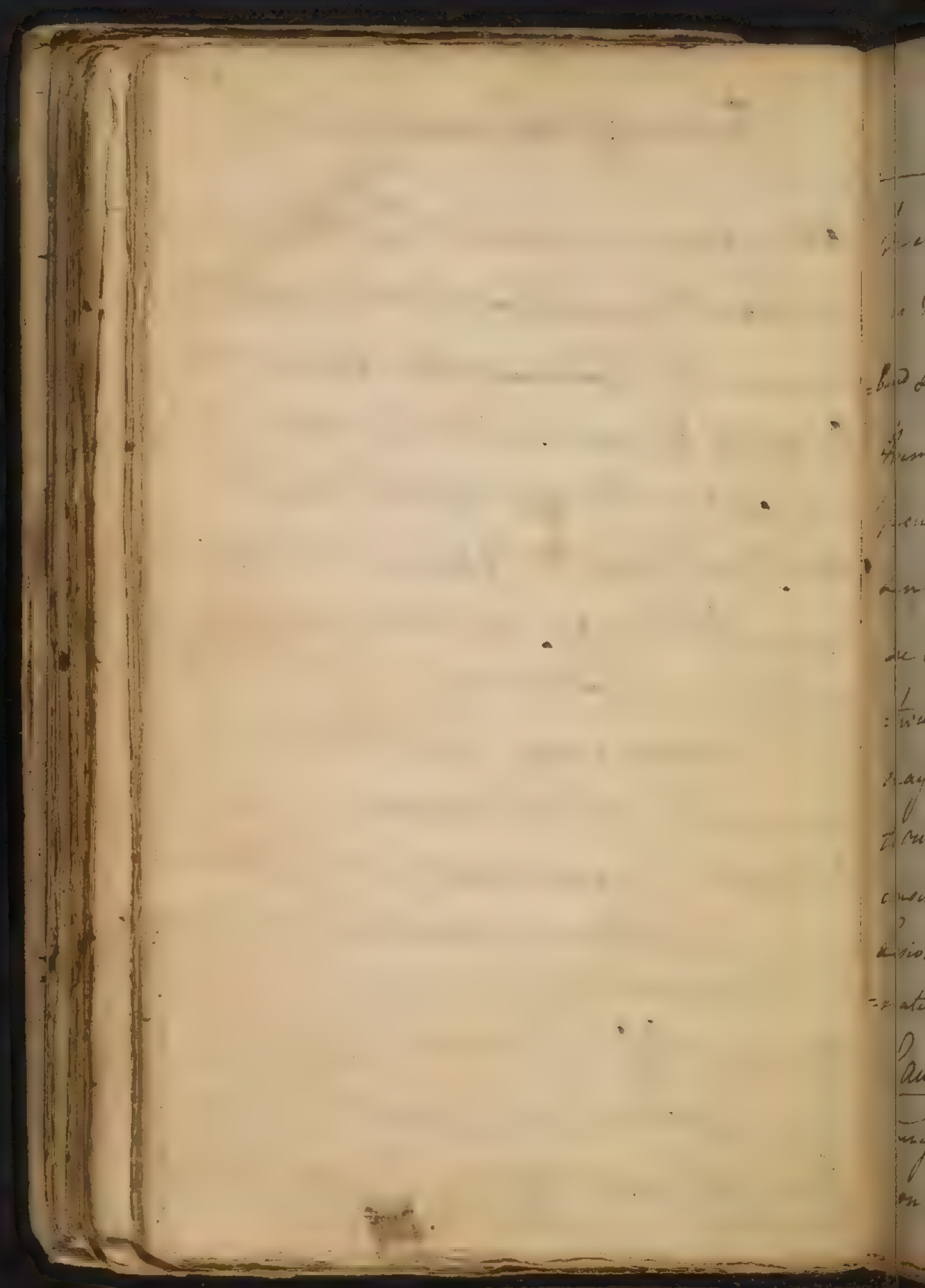


## Causes of a Disease what? <sup>298</sup>

Other Causes connected <sup>th</sup> w: the proximate  
he calls Principia or only possible  
Causes. M. Sauvage has adopted this  
Distinction & used it thro' his work. Could  
we adopt it likewise it would overthrow  
all the Distinctions of proximate & remote  
Causes, & thus give us more simple Views  
of the Causes of Diseases. The word Princi-  
-pia includes every Cause that is not  
proximate. But however just this  
Distinction is we must not dissent so  
much from the common Language of  
the Schools as to adopt it.

One more Difficulty occurs here & y<sup>d</sup> is  
how shall we distinguish a Disease  
from its proximate Cause? See Dr Gaubius  
Answer to this Question § 60.





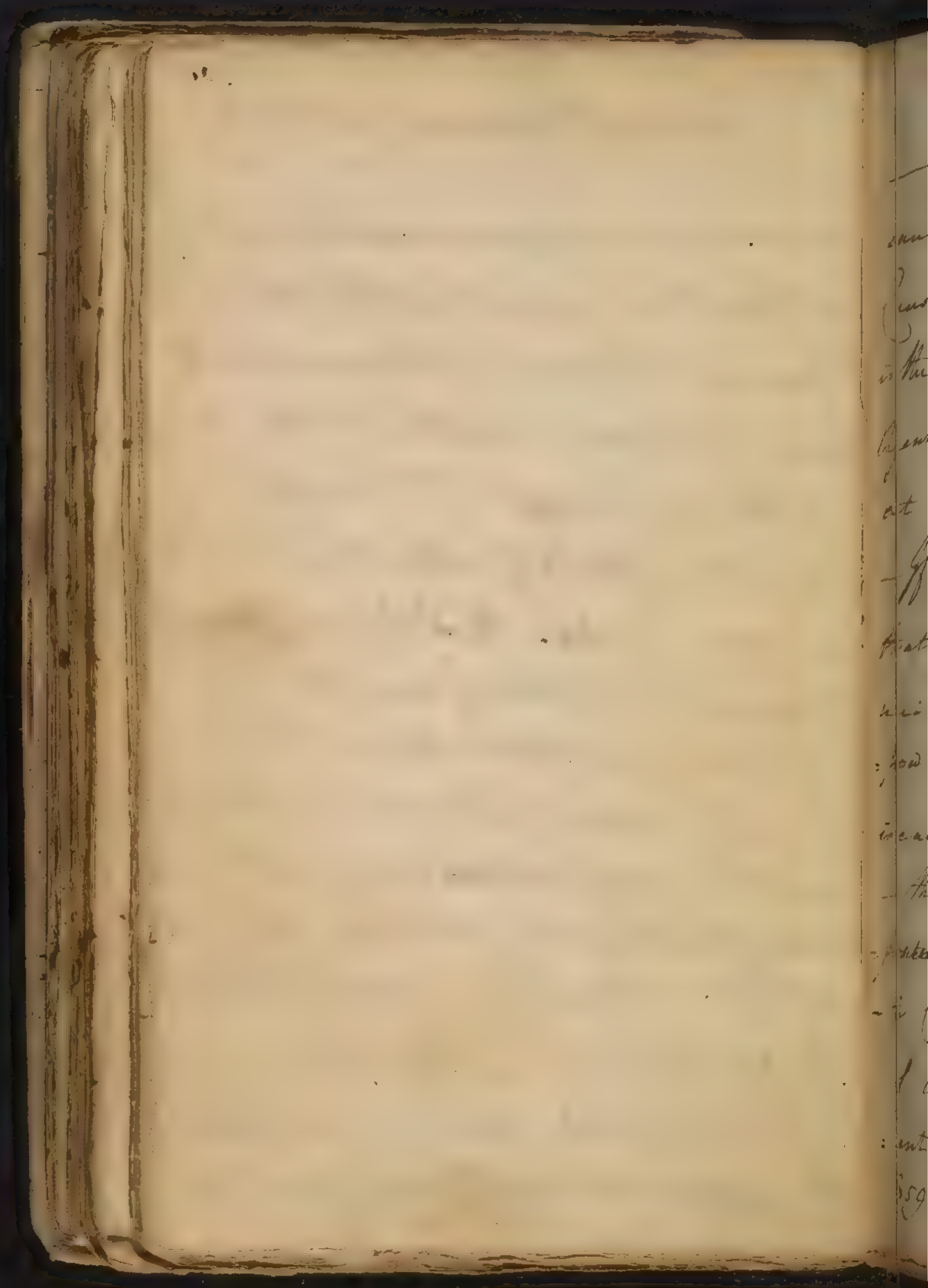
299

## Causes of Diseases What?

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He considers Causes as acting simply  
as Remote but when they are com-  
bined so as to produce a Disease he calls  
them proximate. but this notion is  
peculiar to himself. Dr Boerhaave was  
sensible of the Difficulty of this Question  
see again 2740. the Difference then be-  
tween a Disease & its proximate Cause  
may easily be resolved by having Recourse  
to our Definition of a Disease viz: that it  
consisted in 'apparent & uneasy & permanent  
Lesions of the Functions of the Body. the proxi-  
-mate Cause is that w<sup>ch</sup> occasions these Symptoms.

Causes taken in a larger Sense are  
very compound. some Causes act only  
on certain Bodies, & some Bodies again





## Causes of Diseases what?

can only be acted upon by certain Causes. in the human body the body is the Patient, external bodies are the Agents <sup>th</sup> act on it, & these Agents will act according to the Condition of the body. — If a body is affected by an Agent that does not act on all human bodies universally that body is said to be predisposed to such an Affection, & this Cause is called in Latin "Causa Predisponens" — These Agents <sup>th</sup> act only in Cases of Predisposition and called Occasional or provocative Causes. hence Dr Boerhaave speaking of Occasional Causes says "foliis nocent predispositis", see also Dr Gaurius §59 on the Distinction of these two Causes.

*[Faint handwritten text visible on the right edge of the page, likely from the reverse side or an adjacent page.]*

## Causes of a Disease what?

It is not sufficient therefore in enumerating the Causes of Diseases to mention the Occasional ones only. The Remote Causes should always be pointed out likewise as those Causes <sup>do</sup> operate alike on all Constitutions without any peculiar predisposition. Thus a certain Degree of Force will produce a Fracture in every Mans skull. here then you see a Remote Cause producing a Disease without any Predisposition. But again a Predisposition may produce a Disease without an Occasional Cause such as a Plethora which often induces a Hemorrhage without any Occasional Cause to excite it in those who are disposed to it.



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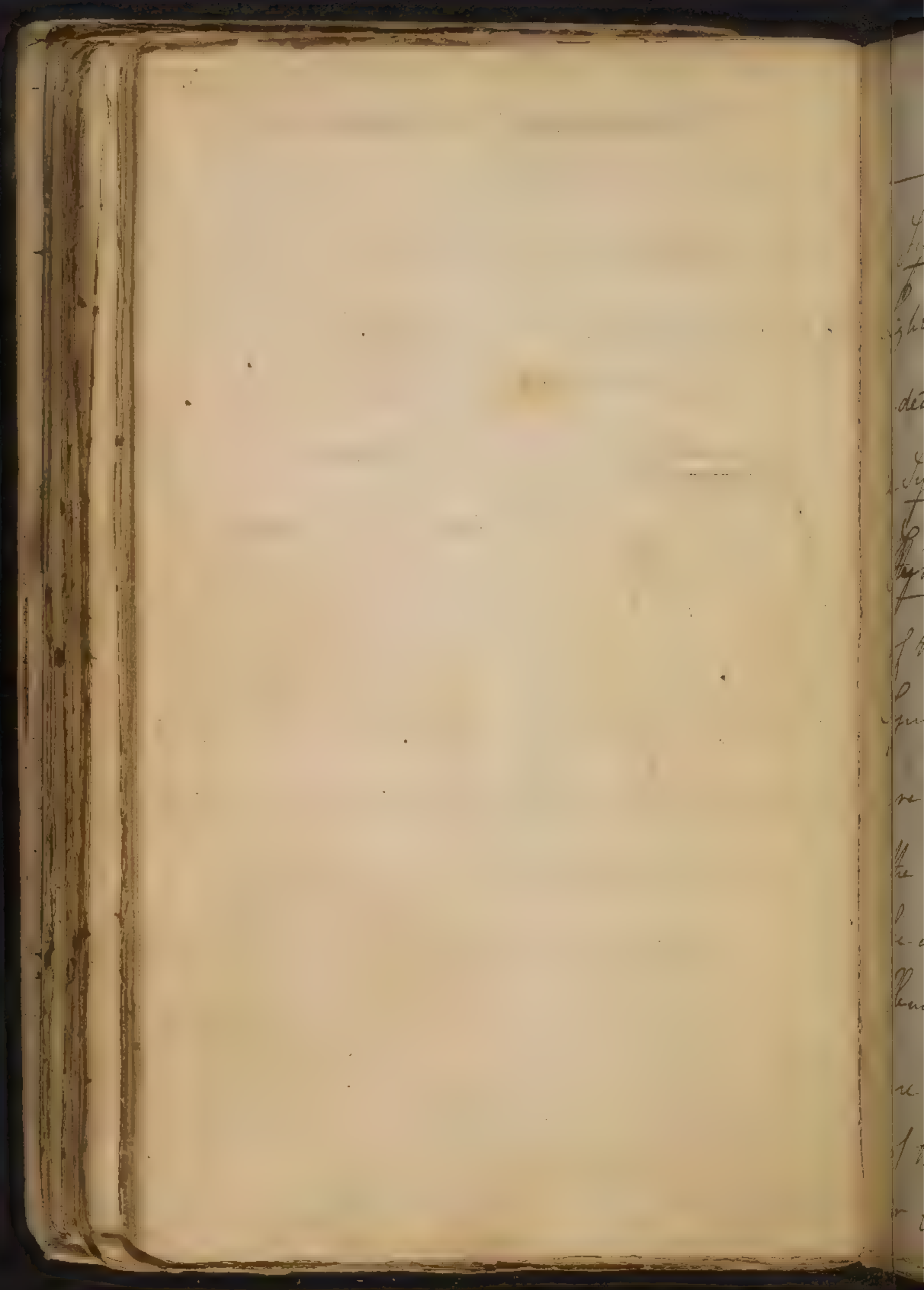
302

## Symptoms of a Disease what?

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This finishes our list of the Causes of Diseases we shall now go on to mention the Terms used to express the Effects of Diseases.

A Symptom is every Apparent Deviation from the usual ordinary healthy state or every Phenomenon which does not occur in Health. It is always somewhat externally evident. a Symptom may sometimes be the Disease itself as in the Case of the Loss of Sight - but a Case of this kind very seldom occurs, & even a Loss of Sight is always attended with more or less of a preternatural enlargement of the pupil or with Head-ache. a Disease then & its Symptoms may in almost all Cases be distinguished from each other. See Gaubius § 86.





## Symptoms of a Disease what?

Symptoms have been viewed in different lights from their Causes & have been divided into 3 kinds 1<sup>st</sup> Symptomata Morbi.

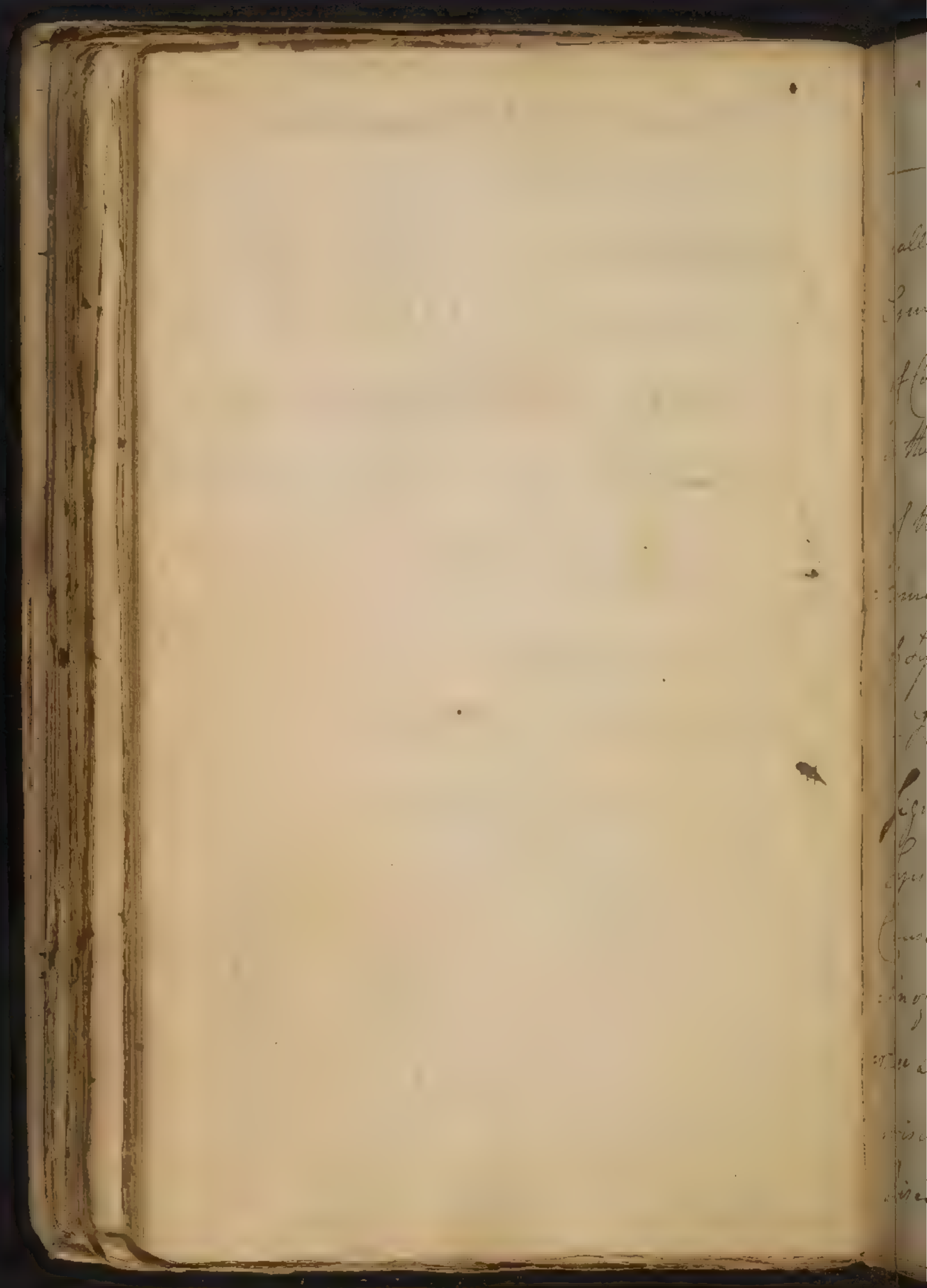
2<sup>nd</sup> Symptomata Causae & 3<sup>rd</sup> Symptomata  
Symptomatum. the 1<sup>st</sup> are 1<sup>st</sup> Symptoms

of the proximate Cause. the 2<sup>nd</sup> are the Symptoms of the remote Causes. the 3<sup>rd</sup>

are secondary Symptoms proceeding from the two first Symptoms. all this may

be illustrated by taking notice of Pleurisy. thus pain - Fever & Cough

are Symptomata morbi or Symptoms of the proximate Cause, but if a conspectus or angina attend a Pleurisy it is

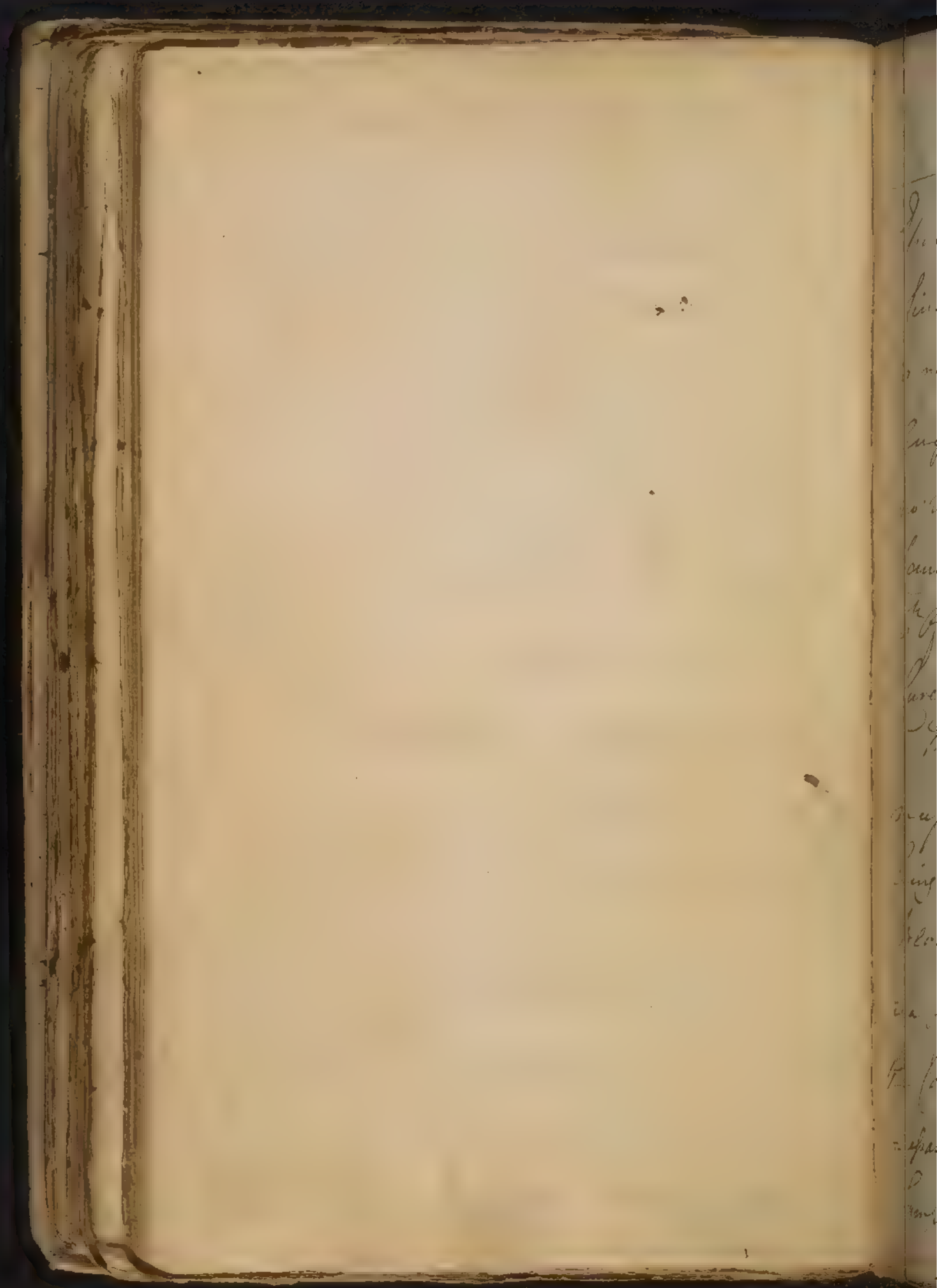


# Symptoms of Diseases what?

called *Symptoma causa remota*, or  
Symptoms arising from the Action  
of Cold. The difficult Respiration <sup>is</sup>  
is the Effect of the Pain & not merely  
of the Inflammation is a *Symptoma Sym-*  
*ptomatis*. The Distinction of these three kinds  
of Symptoms have been this in Physic.

— Then Symptoms <sup>is</sup> are *Pathognomonic*  
Signs of a Disease are properly called  
*Symptomata morbi*. The *Symptomata*  
*Causa cum* rather to arise from a Conjun-  
-tion of two different Diseases. Thus a Hemor-  
-rhage sometimes attends Epilepsy when it  
arises from Plethora, but here are two  
Diseases for we often have Plethora & ero





## Symptoms of a Disease what?

Epilepsy & vice versa, & we moreover find the one often continues after the other is removed. see De Gaubius § 94. the Angina w. Attenua Miliary Fever is by no means to be considered as a Symptoma Causae, but as a superadded Disease w. often requires a different & particular Cure.

The Symptomata Symptomatum are not necessarily present. thus a Person from being afflicted w. a Catarrh may vomit up Blood. here the Hemorrhage from the Lungs is a Symptoma Symptomatum arising from the Catarrh but it does not always necessarily follow a Catarrh. these Symptomata Symptomatum altho' they don't necessarily occur

Wm

William Hobson



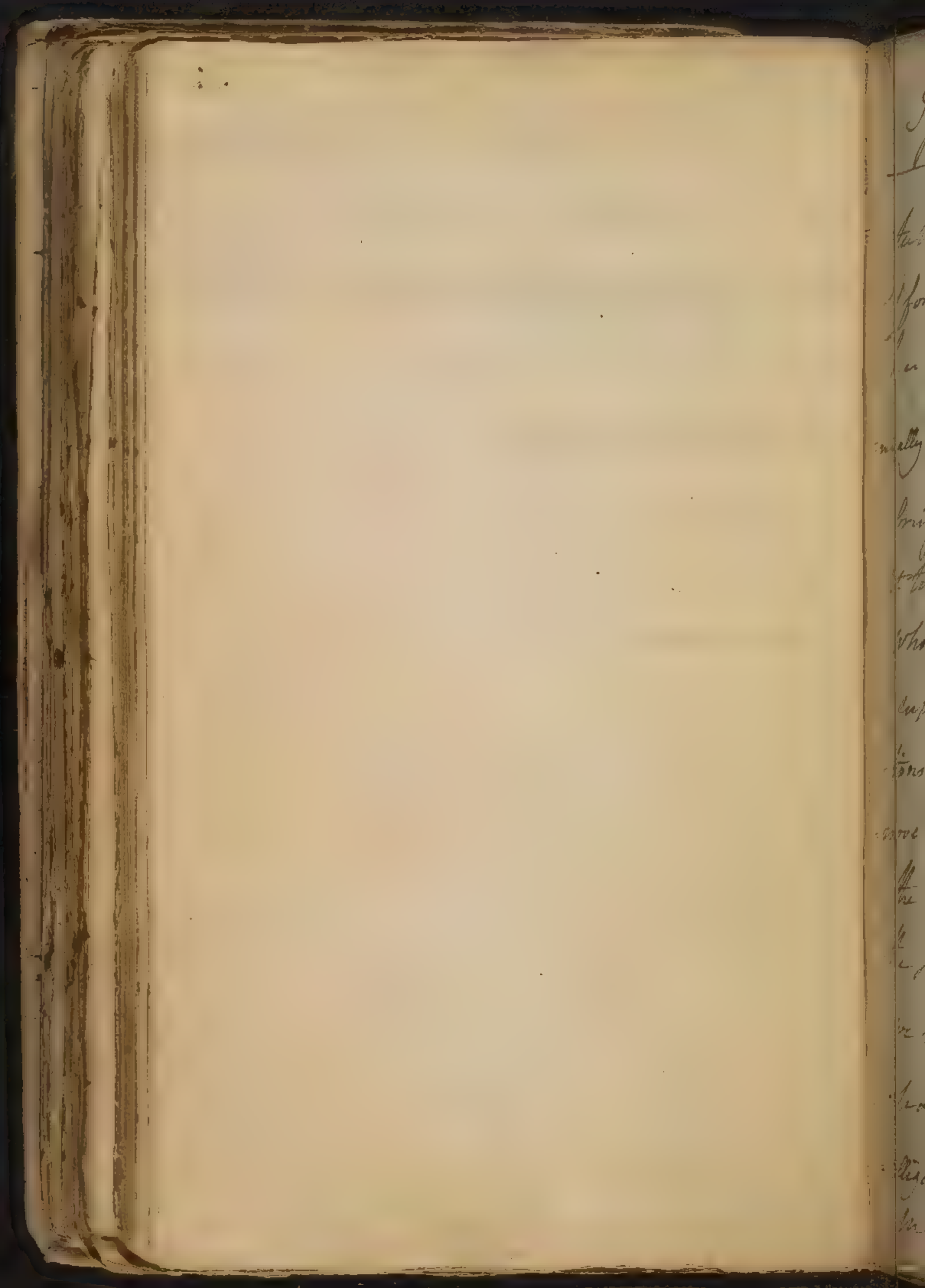
Symptoms of a Disease what? 306

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are nevertheless necessary parts in the History of every Disease as they depend <sup>on</sup> or arise from the proximate Cause. Sometimes

it is difficult to distinguish whether they are *Symptomata Morbi* or *Symptomata Symptomatum*. I have still further the necessity of enumerating them in the History of every Disease. They moreover tend to point out to us the degree or violence of a disease.

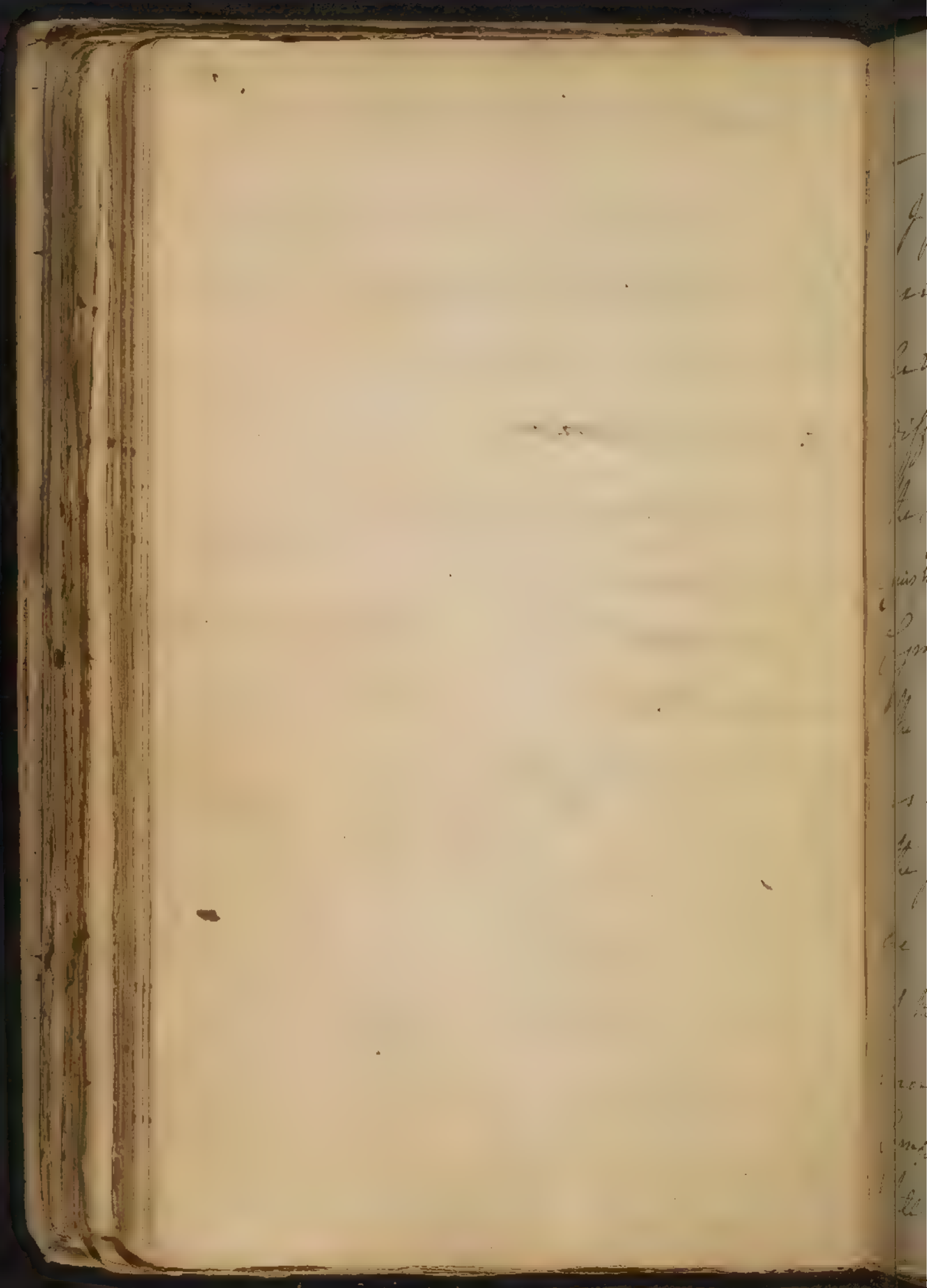
De Gaubius has introduced two other Distinctions of Symptoms viz *Symptomata Activa* & *Passiva*. The 1<sup>st</sup> he supposes to be certain auxiliary Symptoms which occur from the efforts of Nature to cure herself when diseased. Thus vomiting in consequence of some thing poisonous



## Symptoms of a Disease what?

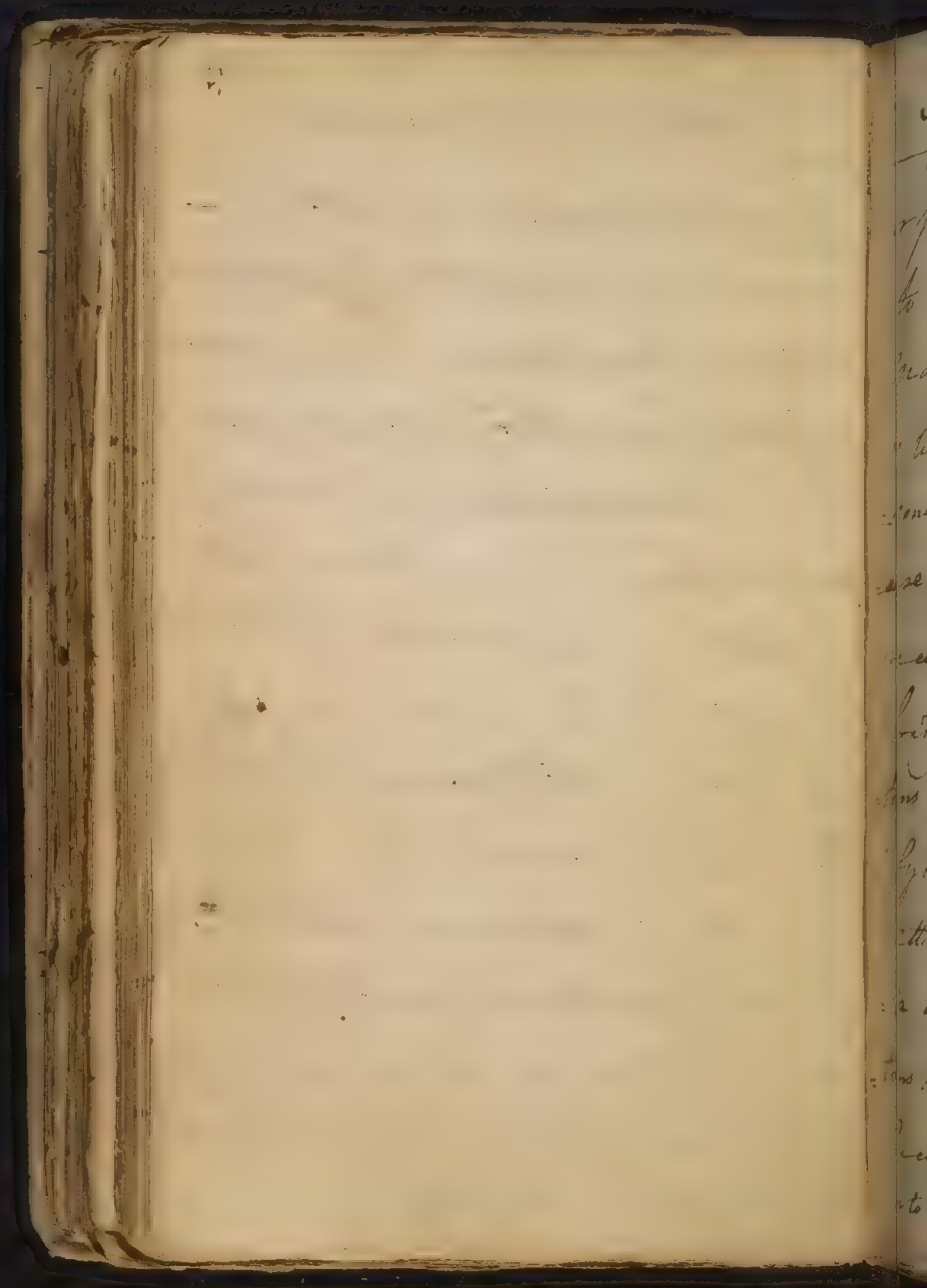
When into the stomach arises from the  
 efforts of nature to remove <sup>the</sup> ~~it~~ offends  
 her. But here the poison acts me-  
 chanically on the stomach, & by its irritation  
 brings the stomach into contraction <sup>the</sup> causes  
 it to throw up: lies there. in a word those  
 who adopt the notion of Symptomatalectica  
 suppose that they are all the mere opera-  
 tions of the soul itself exerted in order to re-  
 move any thing that offends her. I grant  
 the animal body has a power to obviate  
 the tendency of the cause of a disease but  
 we have no reason to suppose this depends  
 upon the action of a rational in-  
 telligent Being, if it does act it must be  
 mechanically in conjunction w: <sup>the</sup> ~~the~~ body





## Symptoms of Disease what?

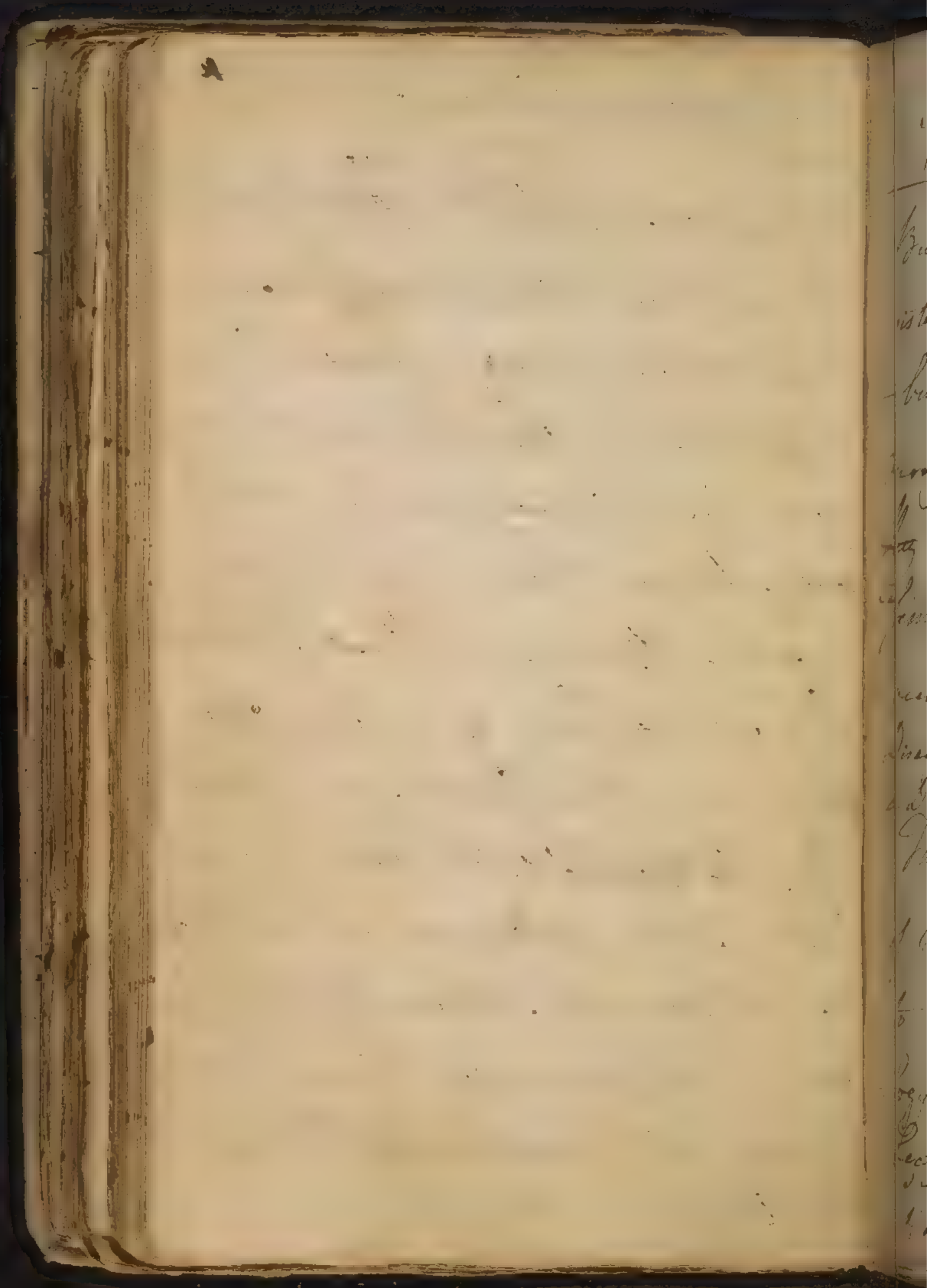
I grant likewise such symptoms do exist as may be called *Symptomata Activa* or *Auxillaria* <sup>id est</sup> are essentially different from the *Symptomata Passiva*. The *Symptomata Activa* are but distinguished in a Fever. During the cold Pitt 4<sup>th</sup> 2<sup>d</sup> Symptoms are merely passive but during the hot Pitt the symptoms are active as Nature is then making efforts to remove the phlegm <sup>id est</sup> which causes the Fever. but there are certain symptoms <sup>id est</sup> which we cannot tell <sup>log id est</sup> of these Cases to refer them, such as more &c there are likewise many other Symptoms in all Diseases <sup>id est</sup> which we cannot tell <sup>id est</sup> which they are, whether they are active





Symptoms of Diseases what? 309

or passive. But there <sup>are</sup> other symptoms  
to be taken notice of besides these. A  
man who is already afflicted w<sup>th</sup> a Disease  
is liable to be afflicted w<sup>th</sup> any other acci-  
dental Cause w<sup>ch</sup> may cause a new Dis-  
ease. Thus a man in a Fever may  
receive a Blow in his Head w<sup>ch</sup> may  
bring on a Train of Accidental Sym-  
ptoms. Now these symptoms are called  
"Symptomata Fortuita", & sh<sup>d</sup> be closely  
attended to, as they are either Poten-  
tia or Sedentia. Upon this Acc<sup>idental</sup> Sym-  
ptoms are distinguished into Essential and  
Accidental or according to Dr. Gaubius  
into "necessaria" & "non-necessaria".



310

## Symptoms of Disease: What?

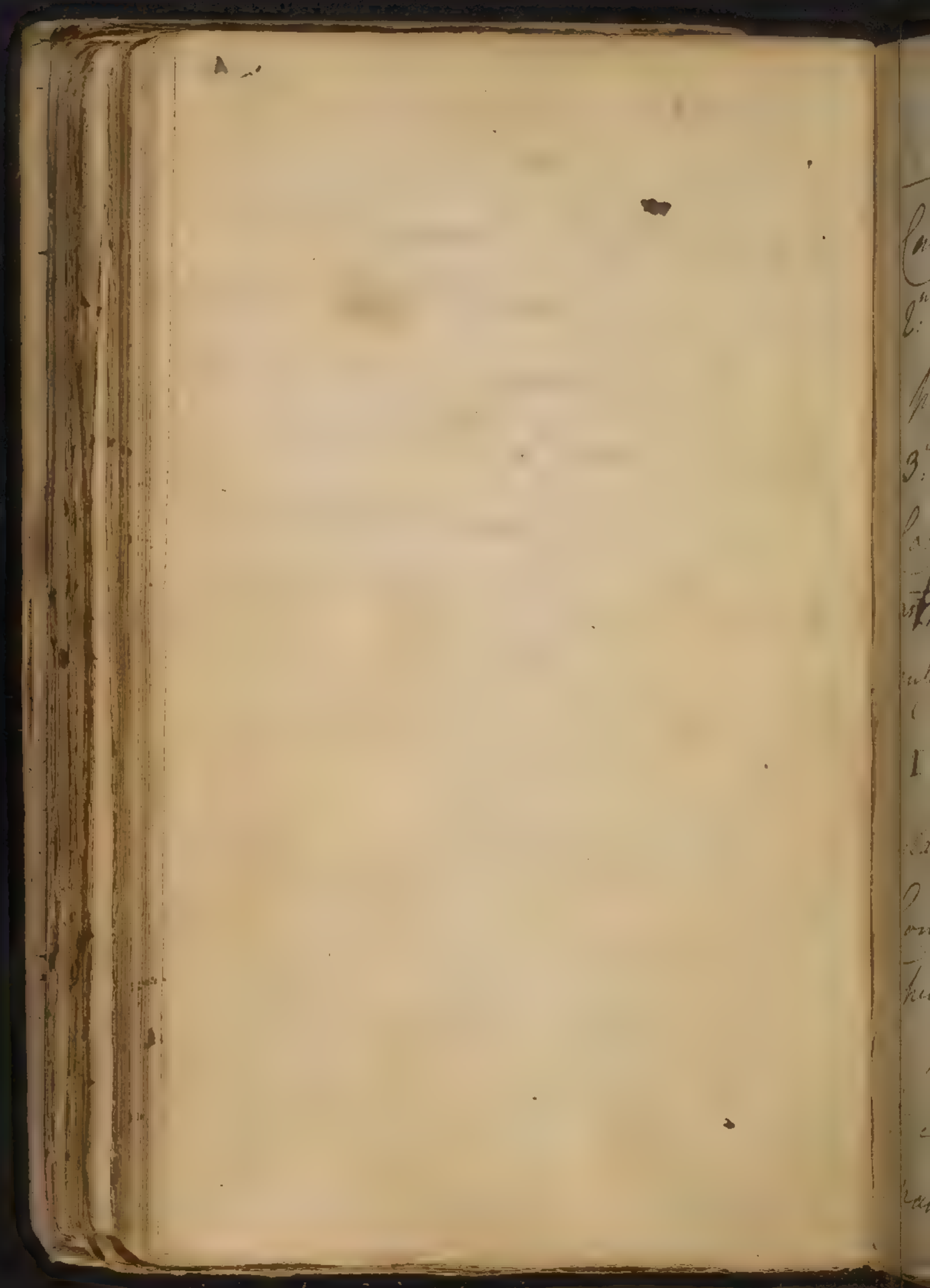
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But Further a Disease we said con-  
sisted in a Concurrence of Symptoms.  
- but these Symptoms were exceedingly  
during the Course of a Disease, hence they  
may have been again divided into  
"Simultanea and perpetua" the first  
occurs mostly in the beginning of a  
Disease. the last more properly characterizes  
a Disease.

This finishes our Explanation of the Terms  
of Pathology. we shall now proceed  
to the Division of the partitions of Patho-  
logy. we shall therefore in our present  
Lectures begin

By considering the proximate





## Plan of Pathology.

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Cause of Diseases.

2<sup>nd</sup> we shall treat of the Symptoms of 4<sup>th</sup>  
Proximate Causes &c.

3<sup>rd</sup> we shall consider the Remote  
Causes or the potestate, however as well  
as those which are occasional and act  
only in Cases of Predispositions.

I The proximate Causes of Diseases are  
seldom simple. They often consist of a  
Complication of Causes w<sup>ch</sup> affect and  
operate on different parts of the Body.  
— But we shall notwithstanding endeavour  
to consider them in as simple a  
Manner as possible as affecting either



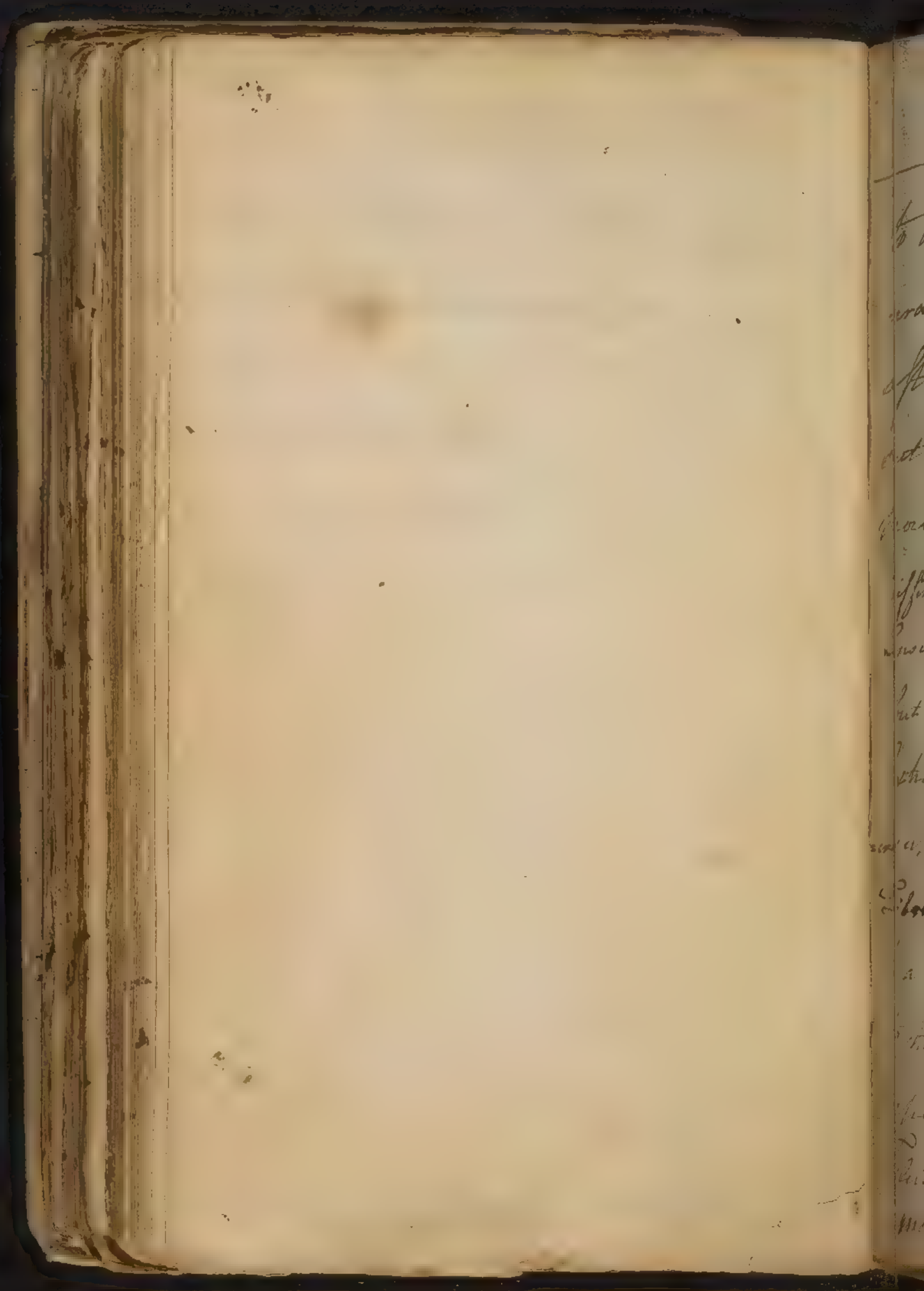


## Plan of Pathology

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the Solids or Solids. we shall begin by pointing out the proximate causes of Diseases in the Solids. These are to be considered as simple, or as solida viva, the Pathology of the simple Solids I delivered fully full when treating of the Physiology of them. I shall therefore proceed to speak of the Diseases of the solida viva or of the moving Fibres. By the solida viva I mean all the Organs of Sense as well as Motion, as there are  $\frac{2}{2}$  two principal <sup>to</sup> functions of the Nervous System. I shall begin by considering the Morbid States of Sensibility.

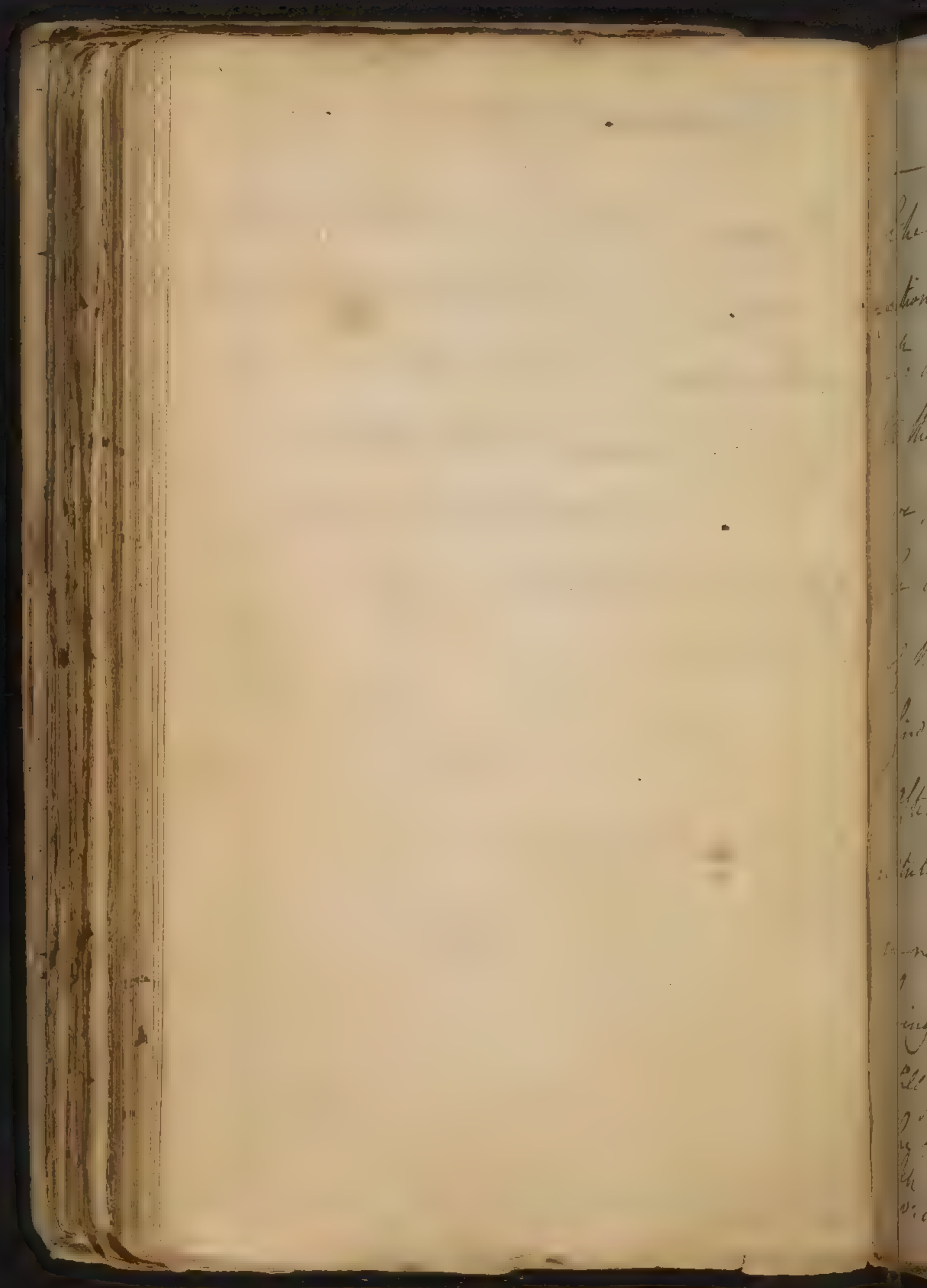
Sensibility is always relative



## Diseases of the Solida Viva.

to be by Empurament or Idiosyncrasy. we cannot pretend to establish a standard of it. we can only point out its Increase or Diminutions of it are morbid. we shall therefore consider the different Circumstances which influence the Sensibility of our Nervous Fibres in general, but more especially those of the sensitive Extremities. Sensibility we know depends upon a certain Condition of the Nervous Fibres <sup>in</sup> we before presumed was owing to a subtle Plastic Fluid always adhering to the nervous <sup>Fibres</sup> Sensibility will then depend upon the Mobility of this Fluid. the more rare & Plastic the more moveable it becomes. this Fluid will



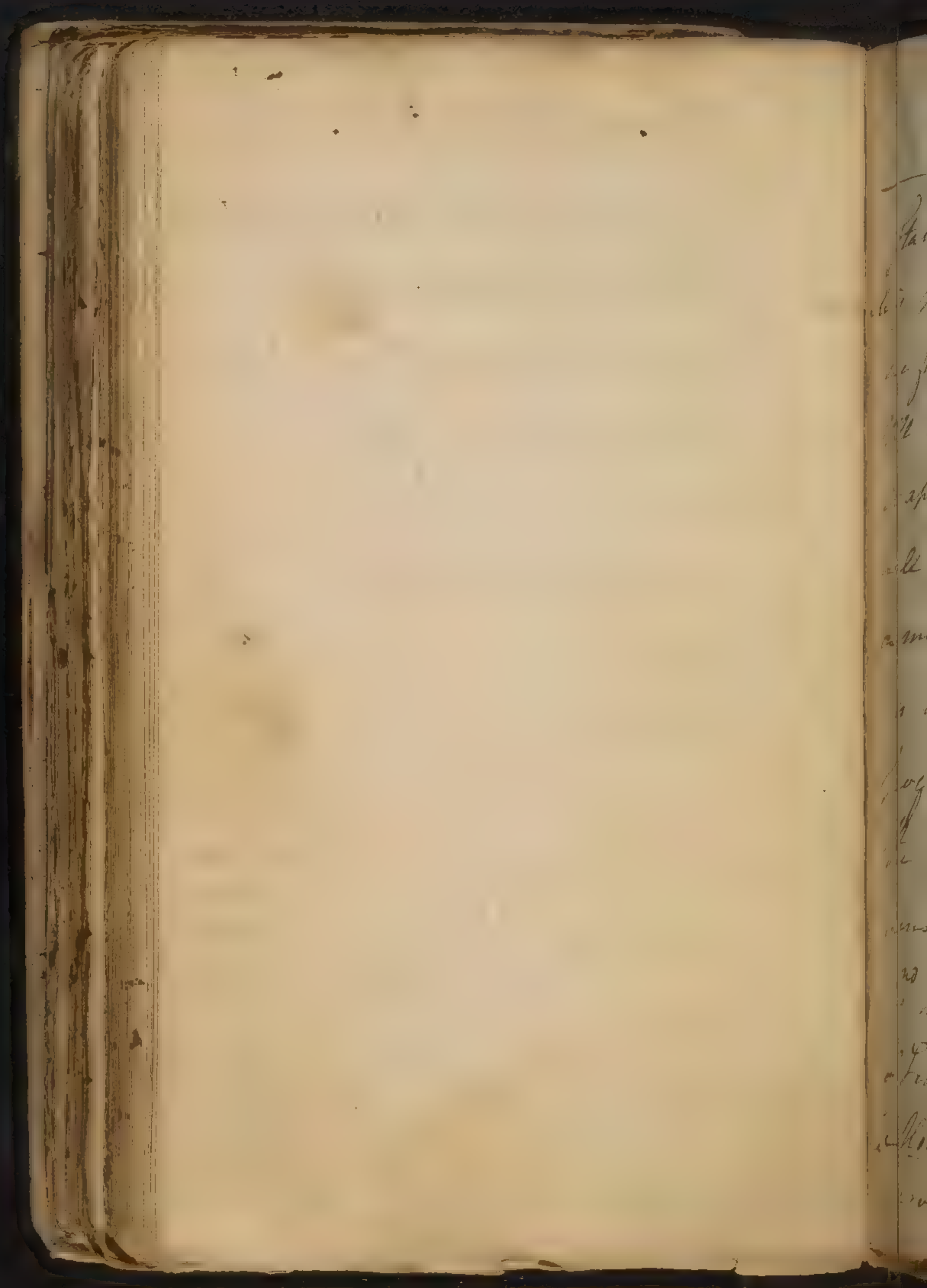


314

## Diseases of the Solida Viva.

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likewise depend upon the Nature or Aggre-  
gation of the solid substance of the nerves.  
<sup>ch</sup> w: we know are widely different according  
to the Nature of the Original Stamina.  
we presume then that Sensibility will  
be considerably influenced by the state  
of the Original Stamina. hence we  
find a peculiar kind of Sensibility  
often runs thro' Life in certain Con-  
stitutions. this appears more probable when  
we recur to w: we before said of <sup>2</sup> nerves ~~the~~ <sup>being</sup>  
being the Organs of Nutrition. we presume  
still further that Sensibility is influenced  
by the Original Stamina from <sup>2</sup> changes  
<sup>ch</sup> w: Sensibility undergoes in different





## Diseases of the Solida Viva.

States of Life. Infants we see have less Possibility than Children further advanced in Life. we find indeed that Possibility is increased till the body arrives at its Acme, from <sup>wh</sup> it appears that the nervous substance as well as the simple solids are acquiring a more firm texture thro' time. The brain is always heavier in proportion to the progress of Life, from <sup>wh</sup> we infer that the nervous Fibres are likewise acquiring Density as well as the brain.

2<sup>nd</sup> External bodies influence the state of Possibility such as Heat & Cold. a Heat first excites the Mobility of the nervous Fluid & very considerably influences

121 " The Ignorance of the Africans & other  
nations who live under the Line may  
be attributed to other accidental causes  
rather than to the Heat of their Climates  
affecting the Vigour of their Faculties. "



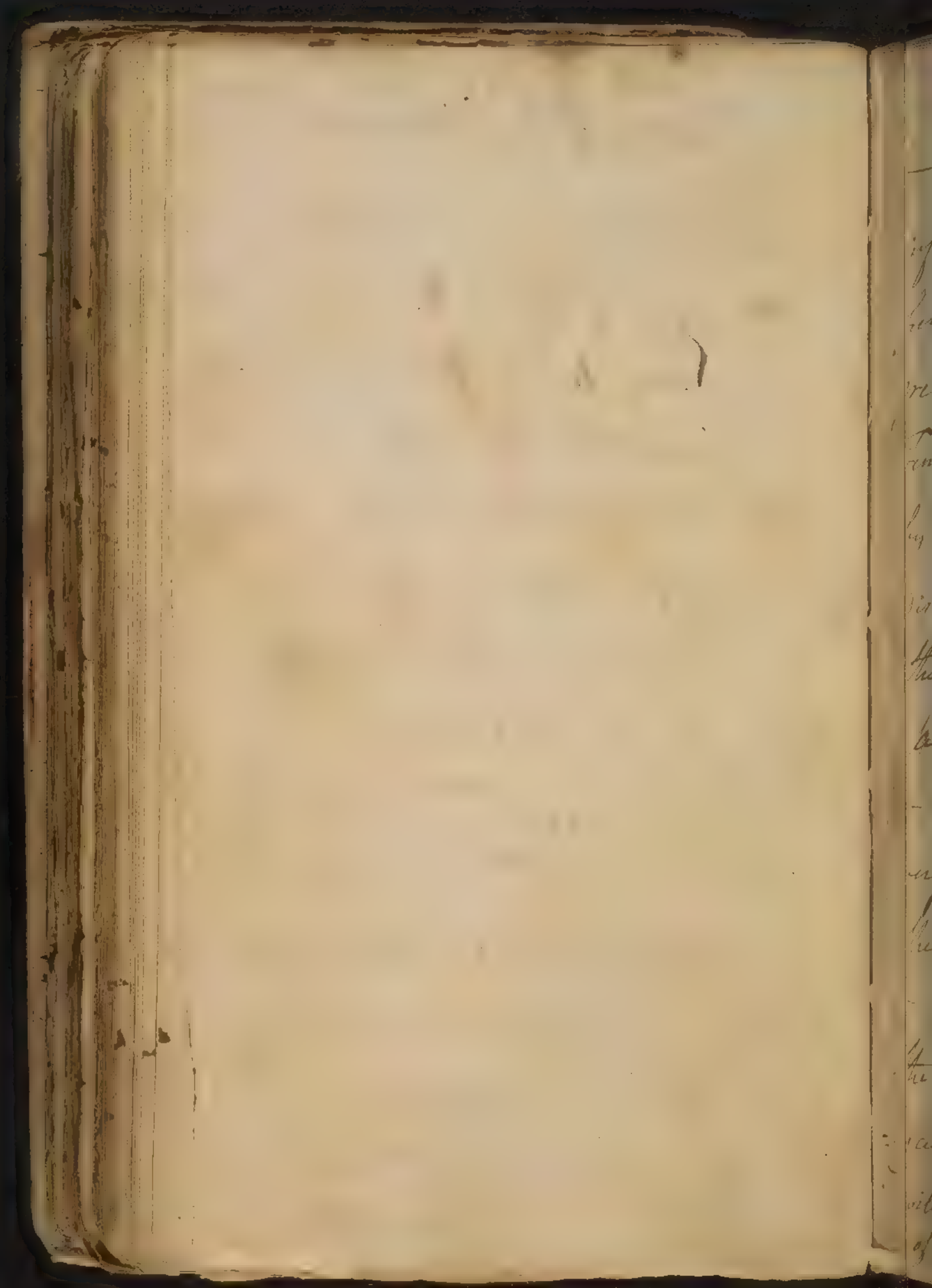
## Diseases of the Solida Viva.

<sup>2</sup> different states of Sensibility in <sup>2</sup> humors.  
 - in general we find it increased by  
 Heat: hence Constitutions are most  
 sensible in warm climates, & ~~most~~ <sup>the</sup>  
 People in hot Countries are always endowed  
 with more exquisite Sensibility in regard to  
 every thing than those who live in cold  
 climates. But again all Constitutions in  
 every climate are more sensible in summer  
 than winter. There is a certain degree of  
 Heat <sup>the</sup> which is most favourable to sensibility  
 inasmuch that every degree of Heat which  
 passes beyond it rather diminishes <sup>sensibility</sup>  
 It is equally unfavourable to our Functions  
 with Cold. It moreover takes off from the



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generating power of Heat which we shall  
 show hereafter is much connected with  
 the Nerves. B, do Stimulants give  
 more Elasticity or mobility to the Nervous  
 Fluid? our Materia Medica writers are  
 signified as that they do from their  
 notions of Cephalics &c. for my part  
 I know of no Stimulants that do excite  
 the Nervous Fluid so as to increase Sensi-  
 bility. But we know another Class  
 of Medicines called Sedatives that do  
 influence Sensibility very considerably.  
 - These Sedative Medicines are either  
 Chemical or Mechanical of which more hereafter.  
 C, Sensibility will be considerably





## Diseases of the Solida viva

influenced by the state of Tension in the  
 patient's rheumatic nature has taken  
 great pains to promote & keep up this  
 Tension in the extremities of the nerves  
 by the uniform manner in w<sup>h</sup> she has  
 distributed the Blood vessels along w<sup>th</sup>  
 the nerves. even in the Retina itself  
 a layer of Blood <sup>vessels</sup> has been discovered.  
 - They are likewise to be demonstrated  
 very plentifully in the accompanying  
 the minute papillae of the Tongue.  
 - We may presume from this that all  
 the nerves in like manner are equal-  
 ly accompanied w<sup>th</sup> Blood vessels. Sensible  
 will therefore depend upon the Tension  
 of these blood vessels & not another Reason

(a) "I believe even Palsies may arise  
from a Compression of an artery  
as well as a nerve so much does  
the arterial blood influence Tension  
& sensibility."

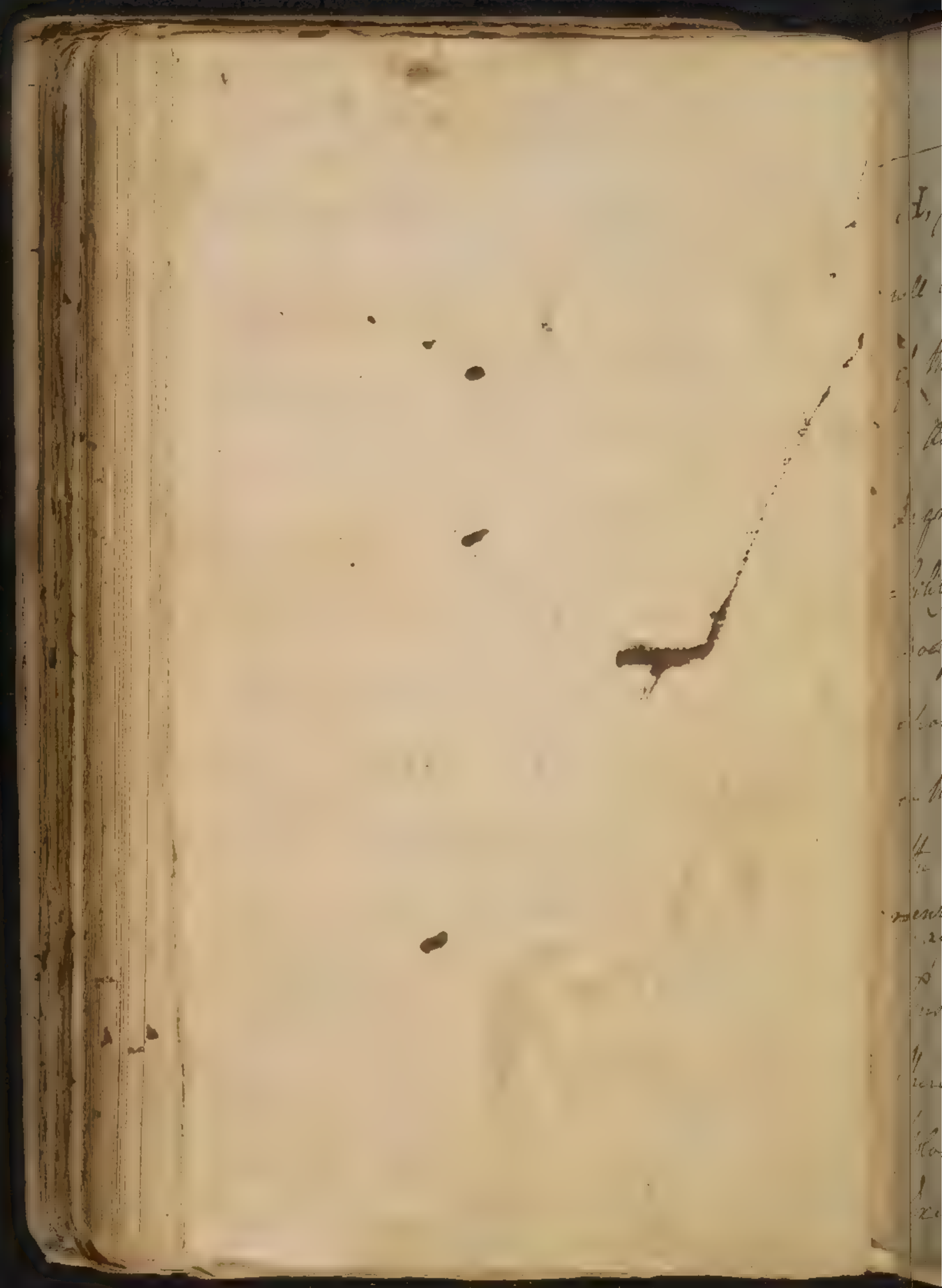


## Diseases of the solida viva

319

offers itself why Sensibility is increasing till the body arrives at its acme upon the account of the disposition to Plethora or to the impetus of the blood in the Arteries during growth. But we have a still more convincing proof of Fission influencing Sensibility from the extreme Sensibility which different parts of the body acquire when inflamed <sup>ch</sup> is solely owing to an increased Influx & Impetus of the blood into the blood vessels. even those parts <sup>ch</sup> have lost their Sensibility by an excretion of cellular substance or from morbid Causes have it again renewed by inflammation. Dr Haller has given us many examples of this. <sup>also</sup>





320

Diseases of the solida tria.

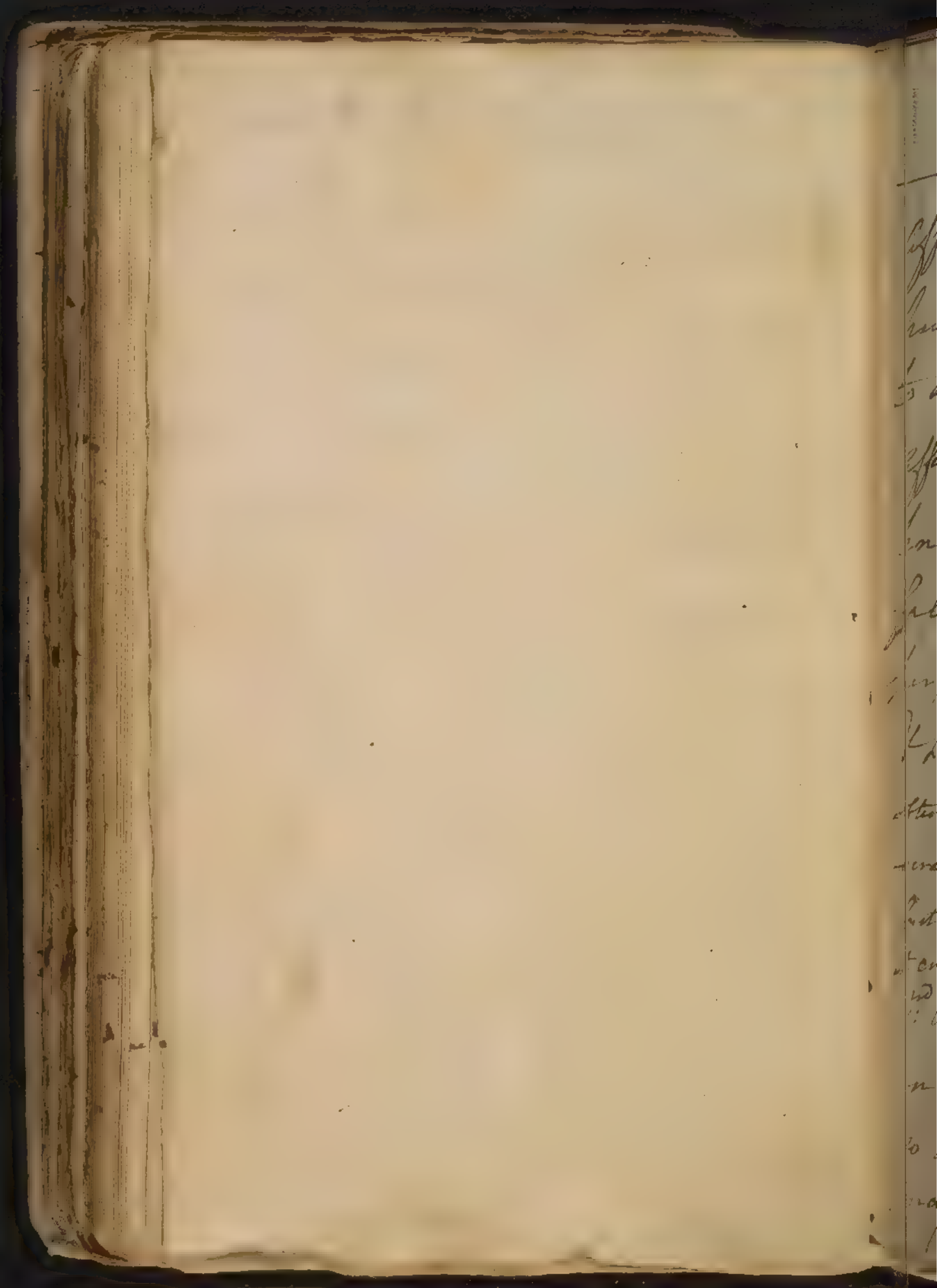
1. Sensibility of the Nervous System  
will depend upon the state of the Origin  
of the Nerves. a certain Freedom of <sup>the</sup> ~~the~~ <sup>sum</sup> ~~sum~~ <sup>person</sup> ~~person~~  
is Absolutely necessary to sensibility. a  
Degree of Compression immediately takes off Sensi-  
bility. This is evident and obvious to every  
Body. But further Sensibility may depend  
upon the different state of Excitement  
in the Sensorium, which greatly affects  
the Intensity of the Nerve. This Excite-  
ment may arise from a proper Degree of  
Tension in consequence of the Influx of Blood  
there. an increased Impetus of the  
Blood we see then gives an additional  
Excitement to the Sensorium. & this increases





## Diseases of the Follicular

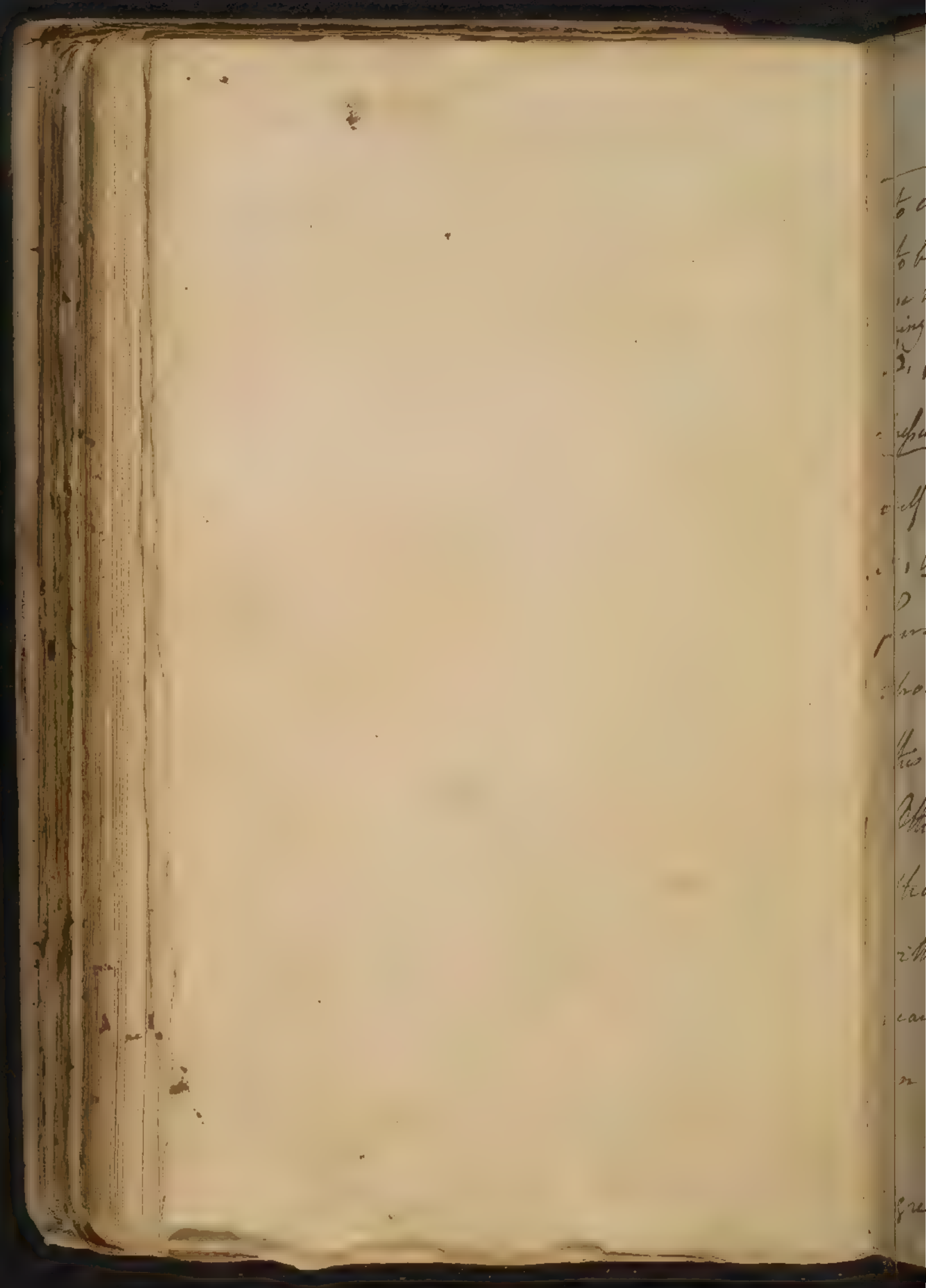
Sensibility. The great Sensibility we  
 observe in Persons affected w<sup>th</sup> Fever seems  
 to arise from the Excitement of y<sup>e</sup> Senso:  
 rium being communicated to every part  
 of the body. We often observe Patients  
 in Phrenesis & Mania that they have  
 a greater Sensibility in some parts  
 than in others to peculiar Impressions  
 this seems to arise from an Exaltation  
 of the Brain being in a more excited  
 State than the other. in these Cases it  
 is difficult to say whether the increas-  
 ed Sensibility depends on an  
 Affection of the Organ on w<sup>ch</sup> the  
 Impressions are made, or upon an



## Diseases of the Solida biva

Affection of the Sensorium itself. I can  
 here add a curious Fact which serves  
 to show that it depends on a morbid  
 affection of the Organ itself. I once  
 knew a Lady who laboured under a  
 false Imagination & fancied she was  
 perpetually surrounded w<sup>th</sup> <sup>the</sup> Goblins  
 & Devils inasmuch that she cried out  
 often in the utmost agony. many Attempts  
 were in vain made to cure her, till at  
 last the Physician who attended her removed  
 it entirely by blind-folding one of her Eyes.  
 2<sup>nd</sup> As an excess of sensibility depends  
 on a too great Tension of the Brain  
 so a want of Tension in the Brain  
 may bring on a want of Sensibility





323

## Diseases of the Solida tria

to external Impressions. This appears to be the Case in Idiots, Altho' I cannot say we have any proof from Dissection of their Brains being in a collapsed flabbid State.

b. Sensibility is diminished by Com:

pression more especially in the Sensorium itself.

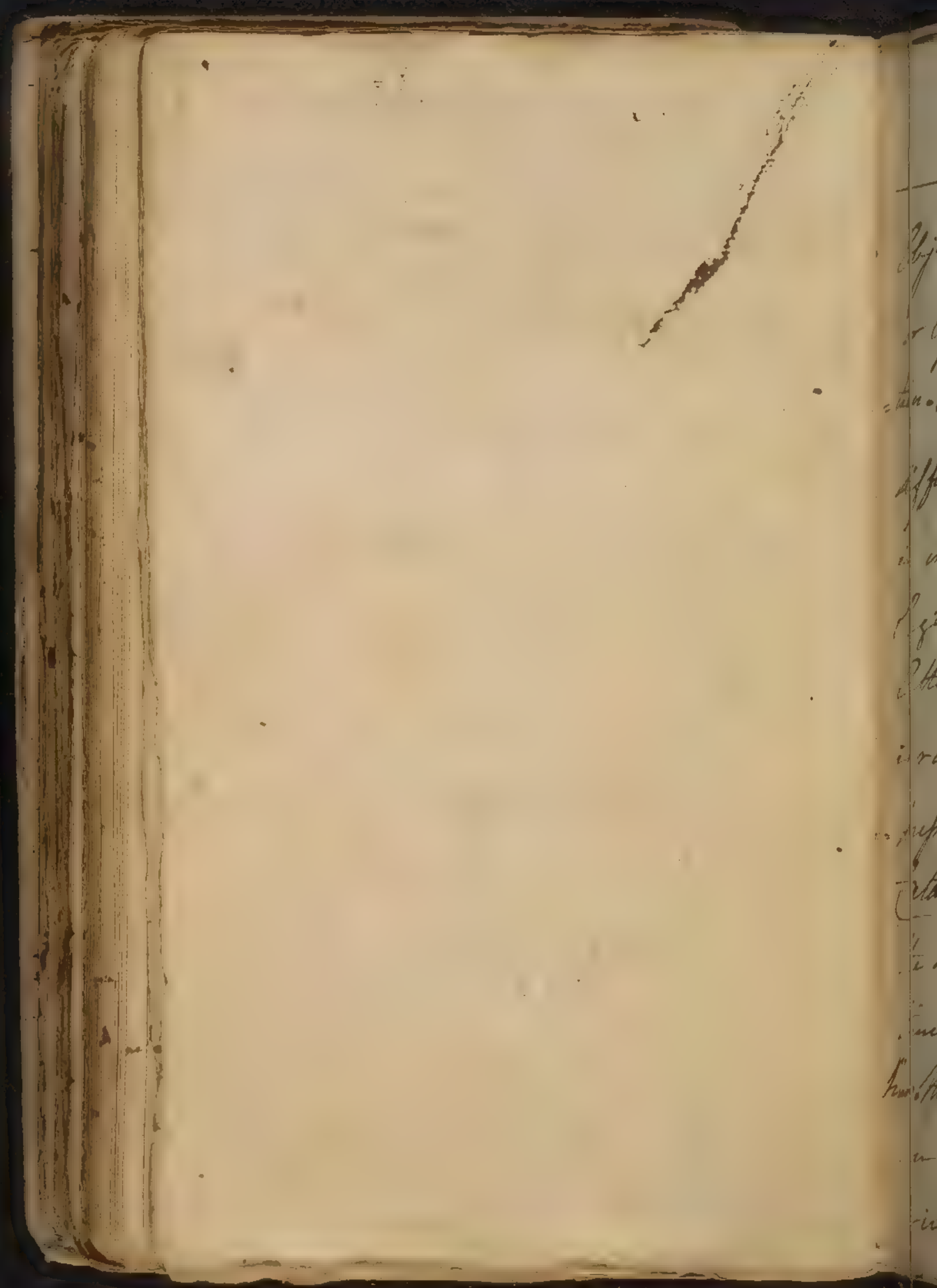
c. Attention very considerably influenced Sensibility. The mind can be employed upon but one Object at one & when

this is the Case it is insensible to all

Other Impressions unless they are much stronger than the one he is occupied with.

Thinking long on one Subject wears the mind, hence there is a Remission in our Attention from particular Objects.

- The Attention of the mind will be greatly influenced by the novelty of the





## Diseases of the Solida tiva.

Object by its being attended w<sup>th</sup> more  
 or less Volition or of interesting Rela:  
 tion. From this you see there may be  
 different Degrees of Attention. When it  
 is in a very high Degree it induces a  
 Rigidity in the Brain in so much that the  
 Attention continues even after the Object  
 is removed <sup>in</sup> excited the Original Im:  
 pression. This appears to be the Case in  
 Catalepsy in w<sup>ch</sup> the Patient continues in  
 the same rigid Posture for a considerable  
 time in which the Disease first seized  
 him. These Catalepsies are generally bro't  
 on by very fixt Attention. Fulpius  
 gives us a remarkable Case of a Man

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## Diseases of the Solida viva

who upon meeting w<sup>th</sup> a Repulse from  
his Mistress remained in a first Cataleptic  
state for many days, & was cured by being  
told that his Mistress w<sup>as</sup> be favourable to him.  
every thing else was in vain attempted to rouse him.  
d. Sensibility may depend upon y<sup>e</sup>

different Degrees of Excitement of the Other  
of our ~~humors~~ Brain. we all know that there  
is an intermediate state of Sensorium  
between sleeping & waking. hence we  
call a man of great vivacity "bien  
veillant" & a very stupid Fellow a  
Creature half a sleep. if these Degrees  
of Sensibility then are so obvious we  
may readily presume that an addi-  
tional Excitement in the Brain may  
greatly influence the Sensibility as



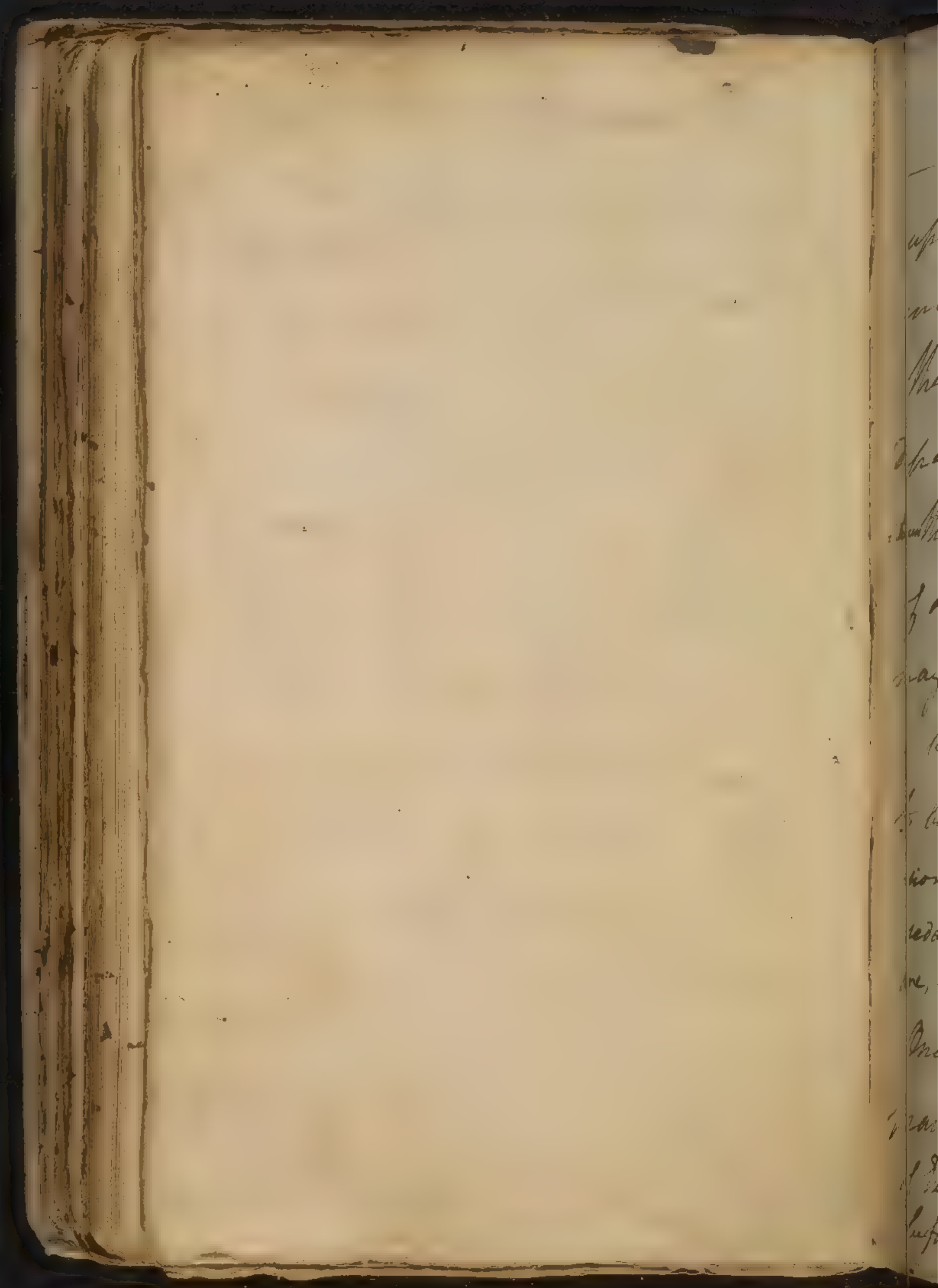
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## Diseases of the Solida tria

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well as the Contractility of the whole System. But here a difficult Question occurs. we have Instances of the Brain's being in a healthy excited State, & the whole System in a morbid State of Tension in Maniacal Persons & yet what is very surprising they are possessed of a high Degree of Insensibility to all external Impressions especially to Cold - Opium - & Medicines of all kind. here is Insensibility connected with the highest State of Excitement in  $\frac{2}{3}$  Insensibility. This seems to overthrow what we have before advanced, but I think it may be reconciled with it. This State of the Insensibility may then depend upon





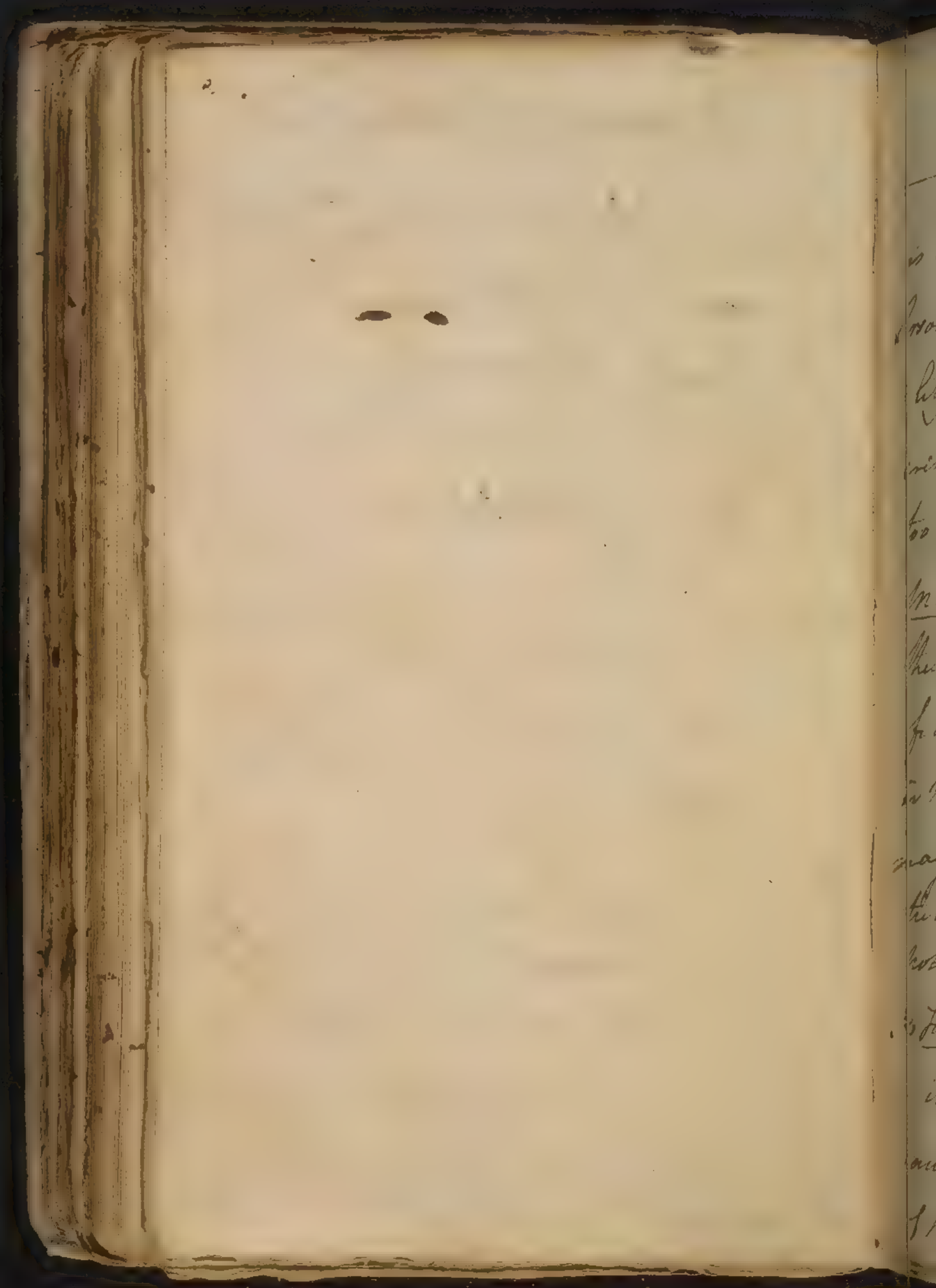
327

Diseases of the Solida Brava

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upon the Density of the Other being  
increased w<sup>th</sup> regard to its Elasticity. for  
the healthy Degree of Sensibility  
depends upon a certain proportion be-  
tween the Elasticity & Density of the Other  
of our nerves. But another solution  
may be given to this difficult Problem  
- we observe the Insensibility of Maniacs  
to be chiefly w<sup>th</sup> regard to sedative impres-  
sions. But are Imitations - & purgatives  
sedative? Some have supposed they  
are, but I cannot say positively that they are.

One more solution may be offered. a  
Maniac may be considered in a state  
of excitement or in that state of Rigidity we  
before spoke of in the Cataplexis. This



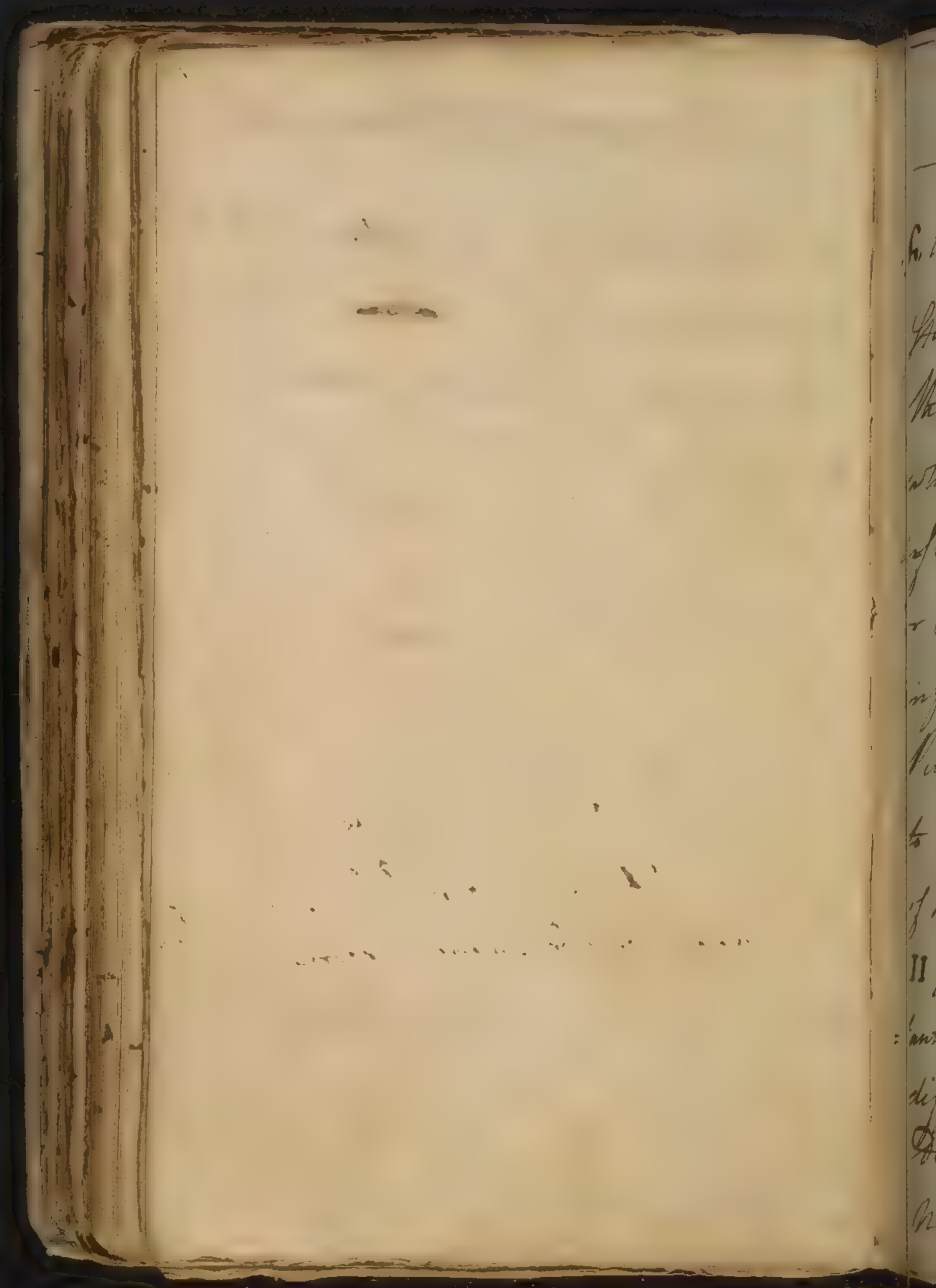


## Diseases of the Solida viva

is evidently the Case in Melancholic  
Persons. & hence their ~~Other~~ Insensibi-  
-lity to Cold & Other Impressions may  
arise from their Attention being busily  
too long fixed to one Object. in the  
Maniac the Case is indeed different for  
their Attention is perpetually running  
from Object to Object yet indeed  
in them the Excitement of their Nerves  
may be in the rigid state of Catalep-  
-tic Patients. Altho' their Sensorium is  
not in that state

e, Sensibility is greatly influenced by Habit.  
- it is then always relative & never  
can depend upon the Absolute Force  
of Impressions.

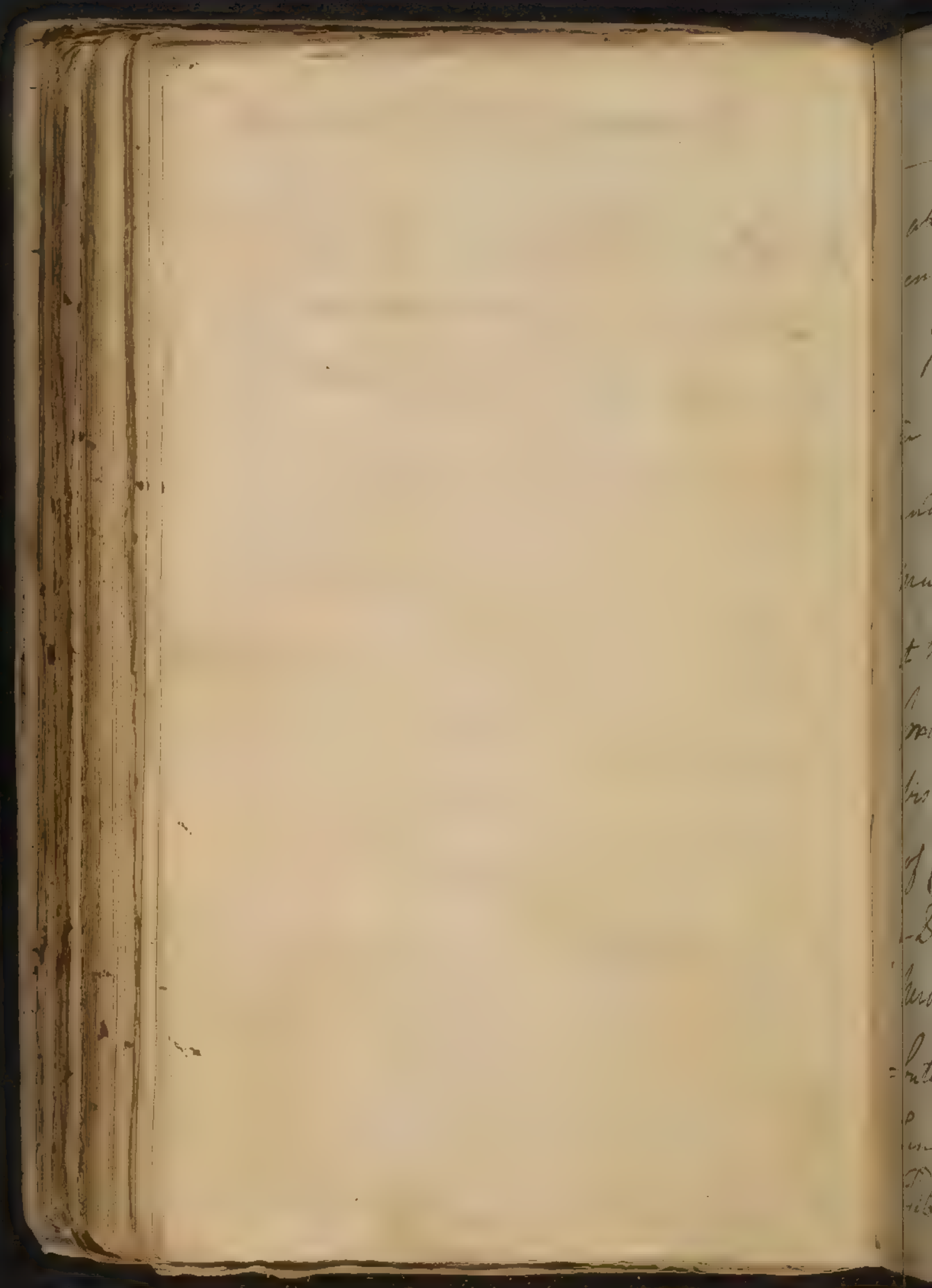




## Diseases of the *soliva viva* <sup>329</sup>

So, lastly Sensibility depends upon the State of the Nerves or Organs of Sense themselves. Thus the Crystalline Lens when more or less opaque greatly influences vision. The ~~E~~ greater or lesser Thickness of the Cornea will influence Sensibility in particular Persons & should always be attended to in enquiring into the different States of Sensibility in different Persons.

II Irritability. This is the most important & for the same Reason the most difficult part of Pathology, as being deeply involved in the mystery of the Nervous System. I shall however



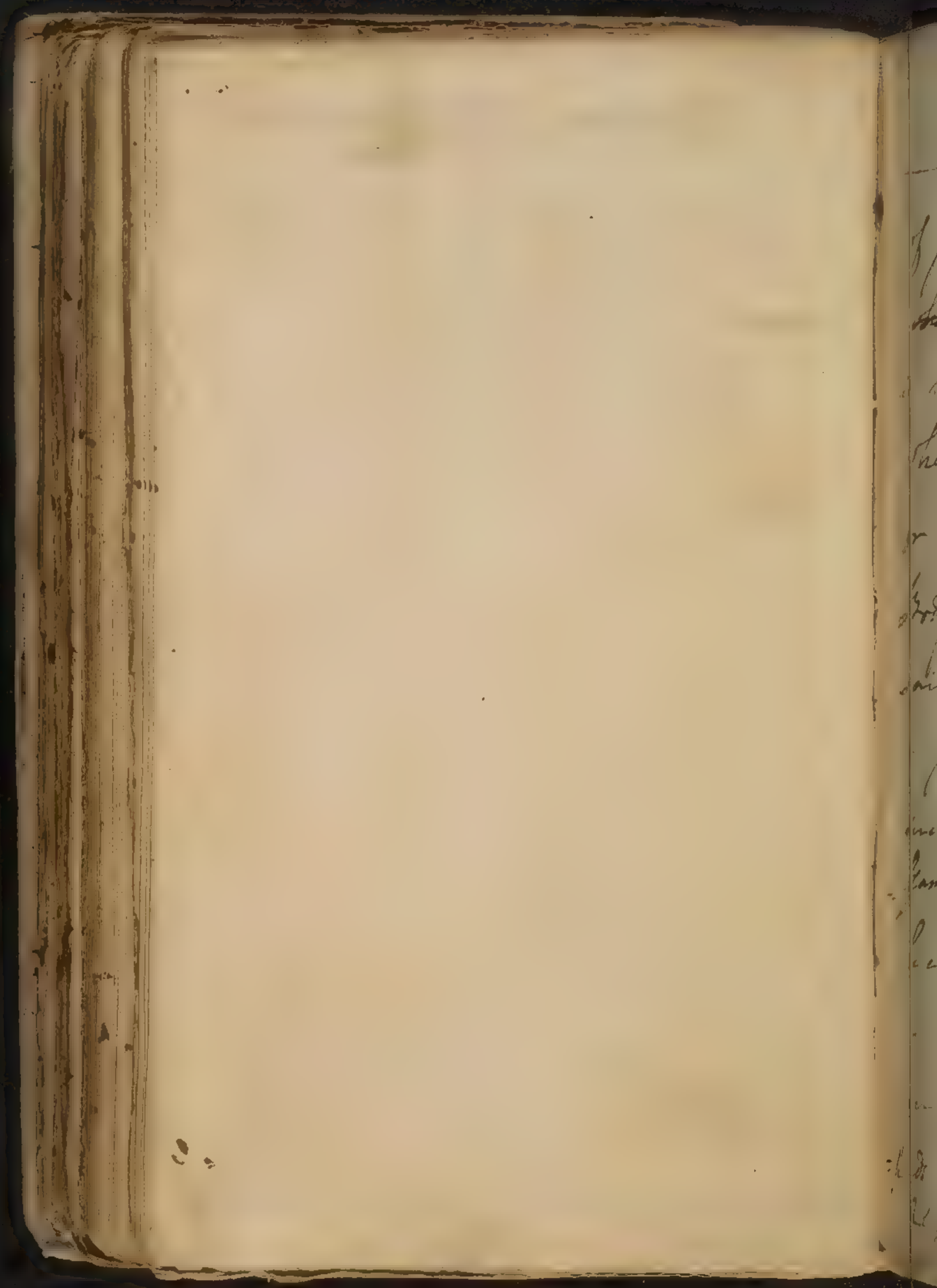
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## Diseases of the *Solida Viva*

attempt to say something upon it, & endeavour to make it as clear as possible.

The word Irritability has been taken in different senses. The Physiologists understand by it the Contractility of Muscular Fibres. Dr. Gaultier calls it the vis vitalis & understands by Irritability the morbid excess of the vis vitalis. Is an excess of strength of Contractility in muscles to be called a Disease? Dr. Whist imagines not. See "Nervous Diseases" p. 91. & therefore attributes all excess of Irritability to too great sensibility or to a weakness of moving fibres. I grant when the excess



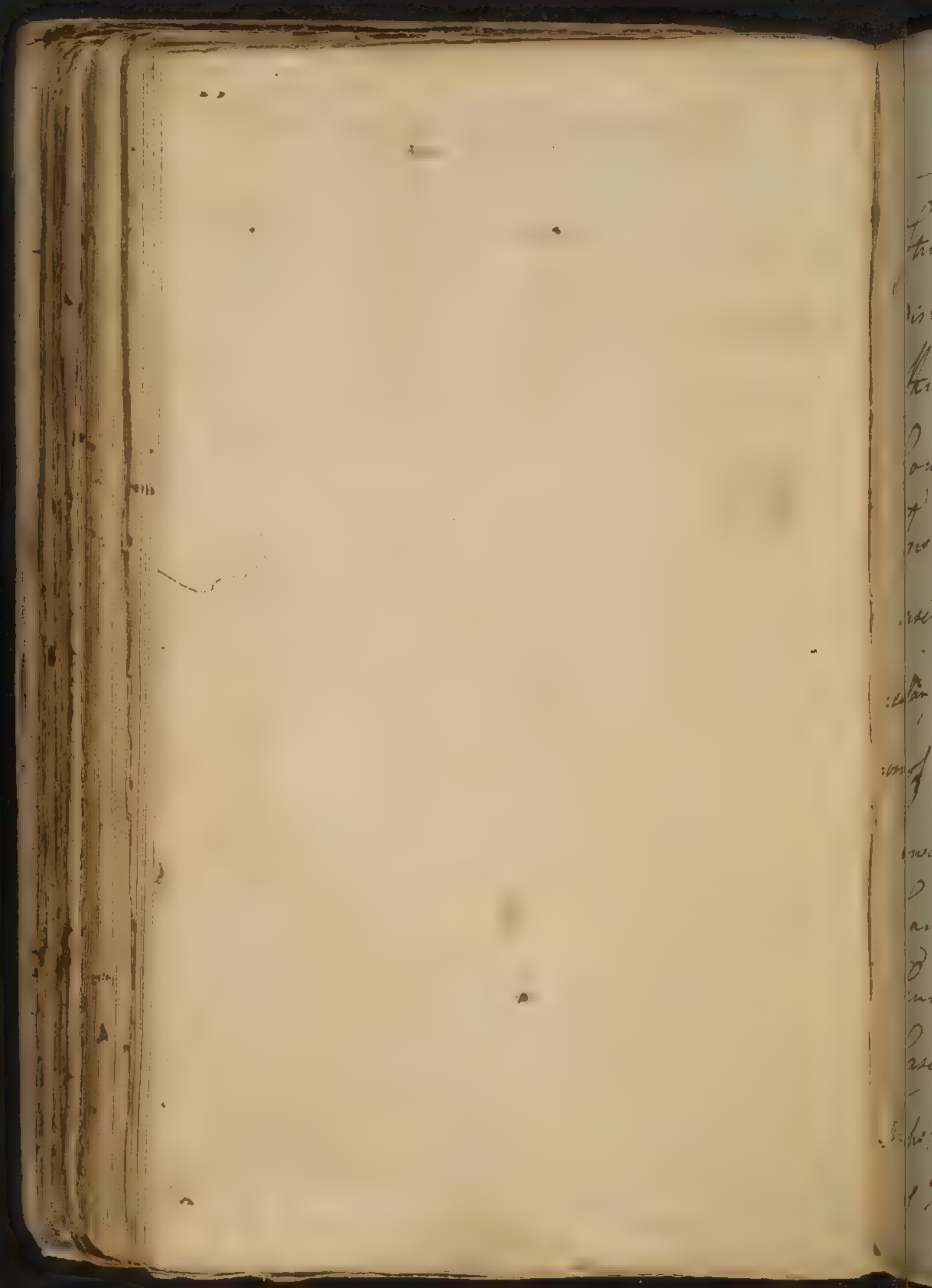
## Diseases of the Solida Brina <sup>331</sup>

of strength the Force of Contractility  
~~where it~~ is diffused all over the Body it  
is not to be called a Disease, but  
when it is in particular parts only  
or when greater in one part of  
Body than the Other then it may be  
said to be a morbid Case of Irritability.

I find it difficult to say in w: Cases  
such a morbid Affection occurs. The In-  
flammatory Diathesis of the Body perhaps may  
be considered as a Disease of this Nature.

— an Inflammatory Diathesis consists in  
an increased Impetus of the Blood w: de-  
pends on an increased Action of the Solids  
& this is always proportioned to the



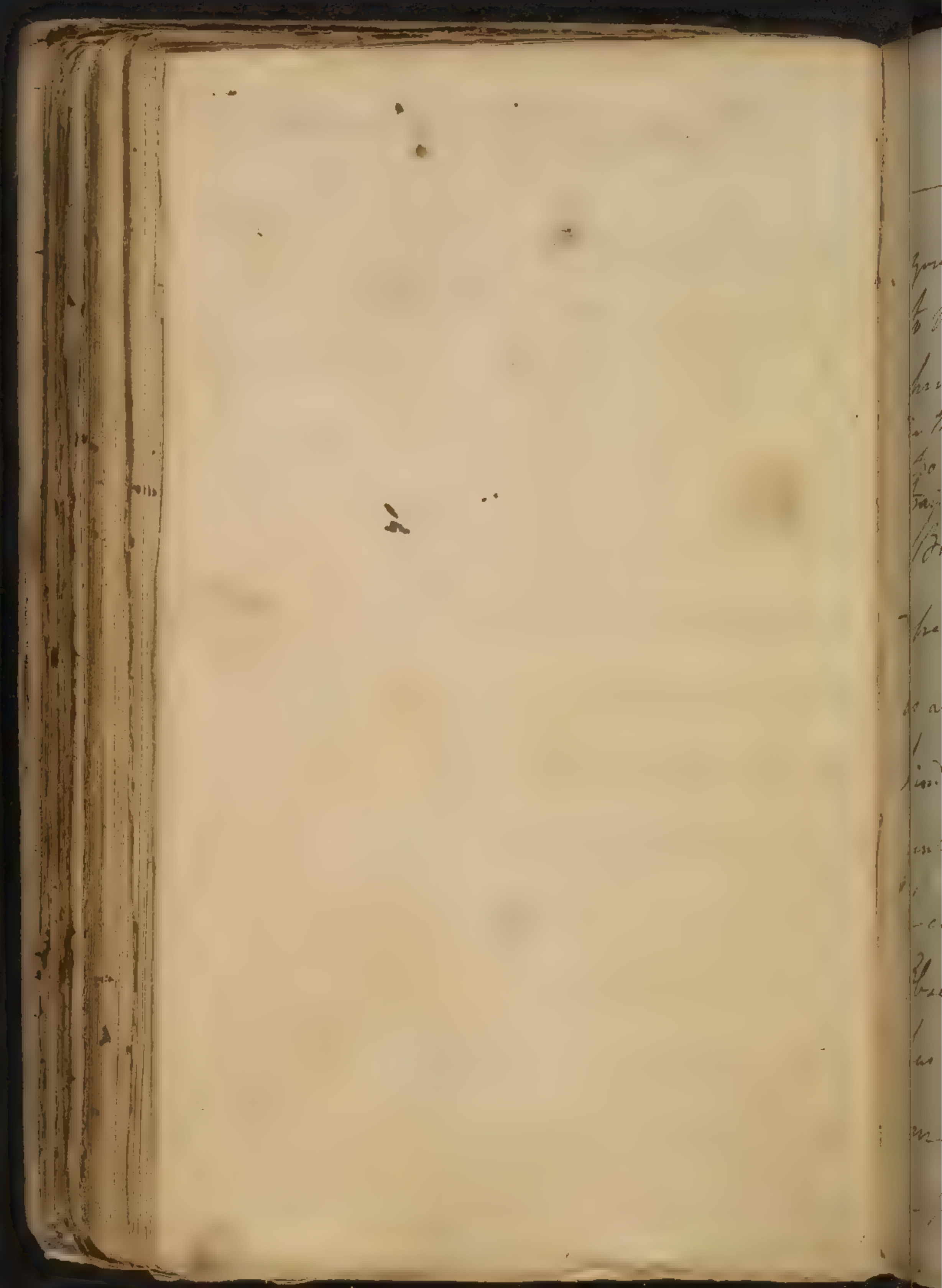


332

## Diseases of the Solida tria

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Stimulus applied to them, or to the distending power of the blood. here there is an increase of the force of Contractility. Hence we often find Instances of topical Fever or an increased Impetus of the blood in particular parts without an increased Action of the Heart & Arteries. this then being owing to nothing else but an increased Contractility or Irritability in that Part. <sup>as</sup> <sup>we</sup> Hence in <sup>the</sup> Physiologists use the word. Other Cases of particular Irritability might perhaps be pointed out as depending on an excess of Fusion in particular parts. Thus a

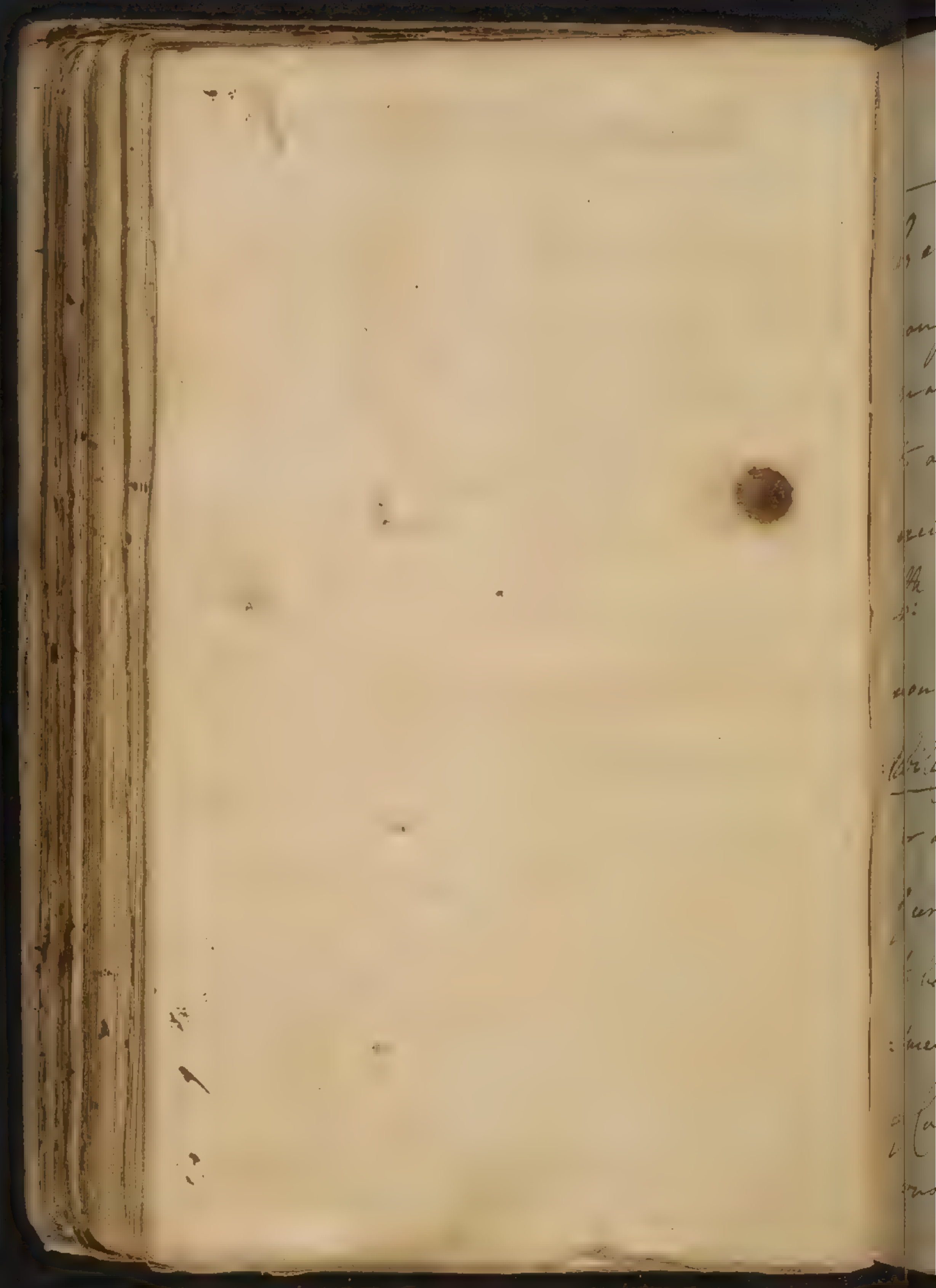




## Diseases of the *foliæ biva.*

young widow who has long been used  
to ven<sup>e</sup> enjoyments when first she is de-  
prived of them, from a tension bro't on  
in the ven<sup>e</sup> Organs & Alimentary Canal to  
so high a degree becomes subject to a  
train of Hysterical Diseases.

But this kind of irritability does not  
depend upon increased sensibility  
as Dr. Gaubius supposes, nor is it that  
kind of Irritability w<sup>h</sup> is excited by  
gentle Stimuli, or gives Rise to what  
he calls the "motus enormis" I must here  
observe that the word Sensibility  
has been used in a too vague sense.  
most of People understand by it  
a power of the Body to be acted on

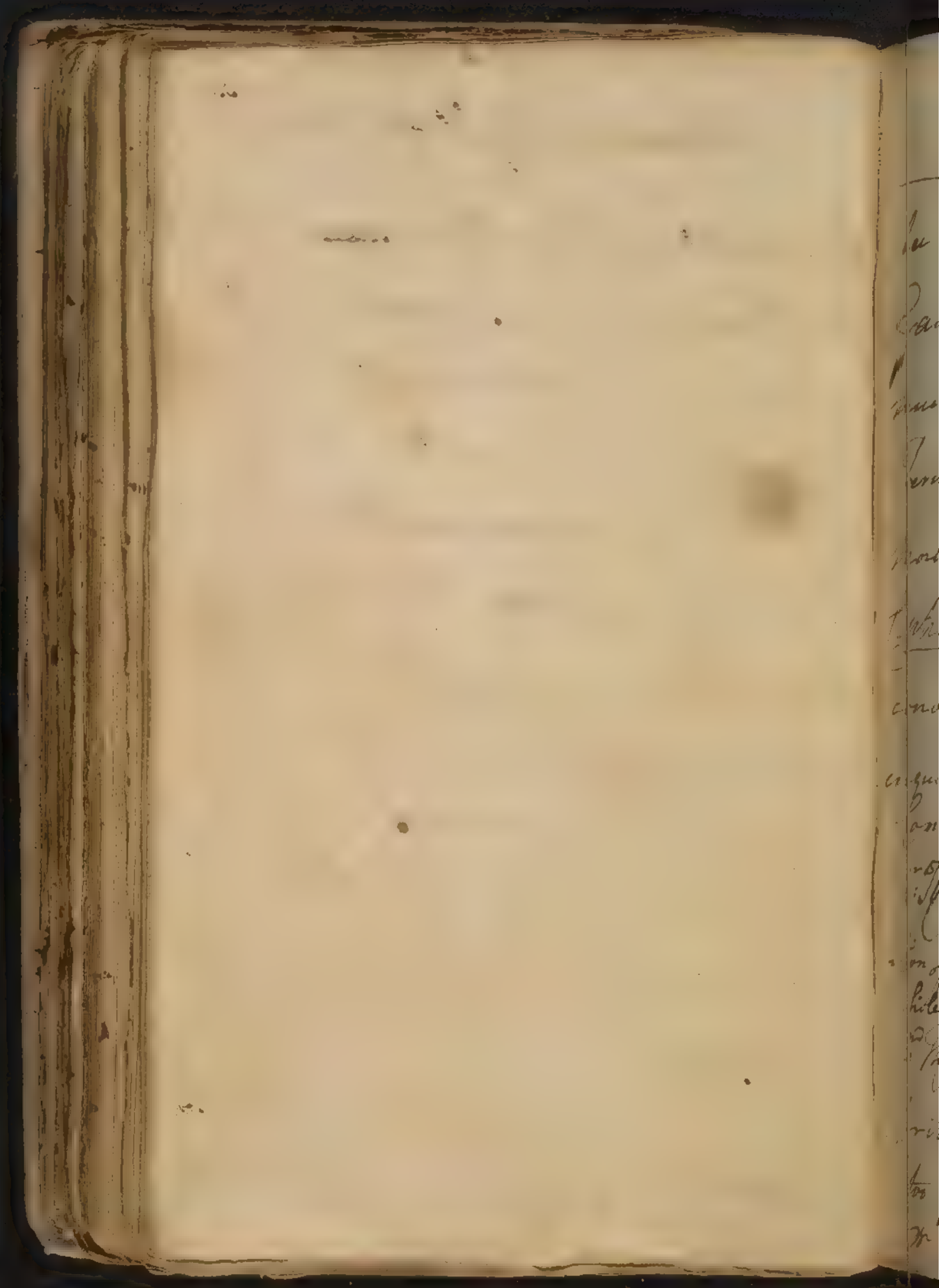


## Diseases of the *foliata viva*.

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by external Agents. but ~~James~~ would  
 confine its meaning to Impressions  
 made on the Nervous System only or  
 to an Impression on One nerve w<sup>ch</sup>  
 excites Contractions on Other parts  
 w<sup>th</sup> the Intervention of Sensation. I  
 would likewise restrict the word Irri-  
tability entirely to Muscular Fibres  
 or a Disposition to contract in consequence  
 of certain Impressions. Irritability is only  
 to be considered as morbid, when it in-  
 duces irregular Contractions. A readiness  
 of Contractility is by no means to be  
 considered as a morbid Irritability.

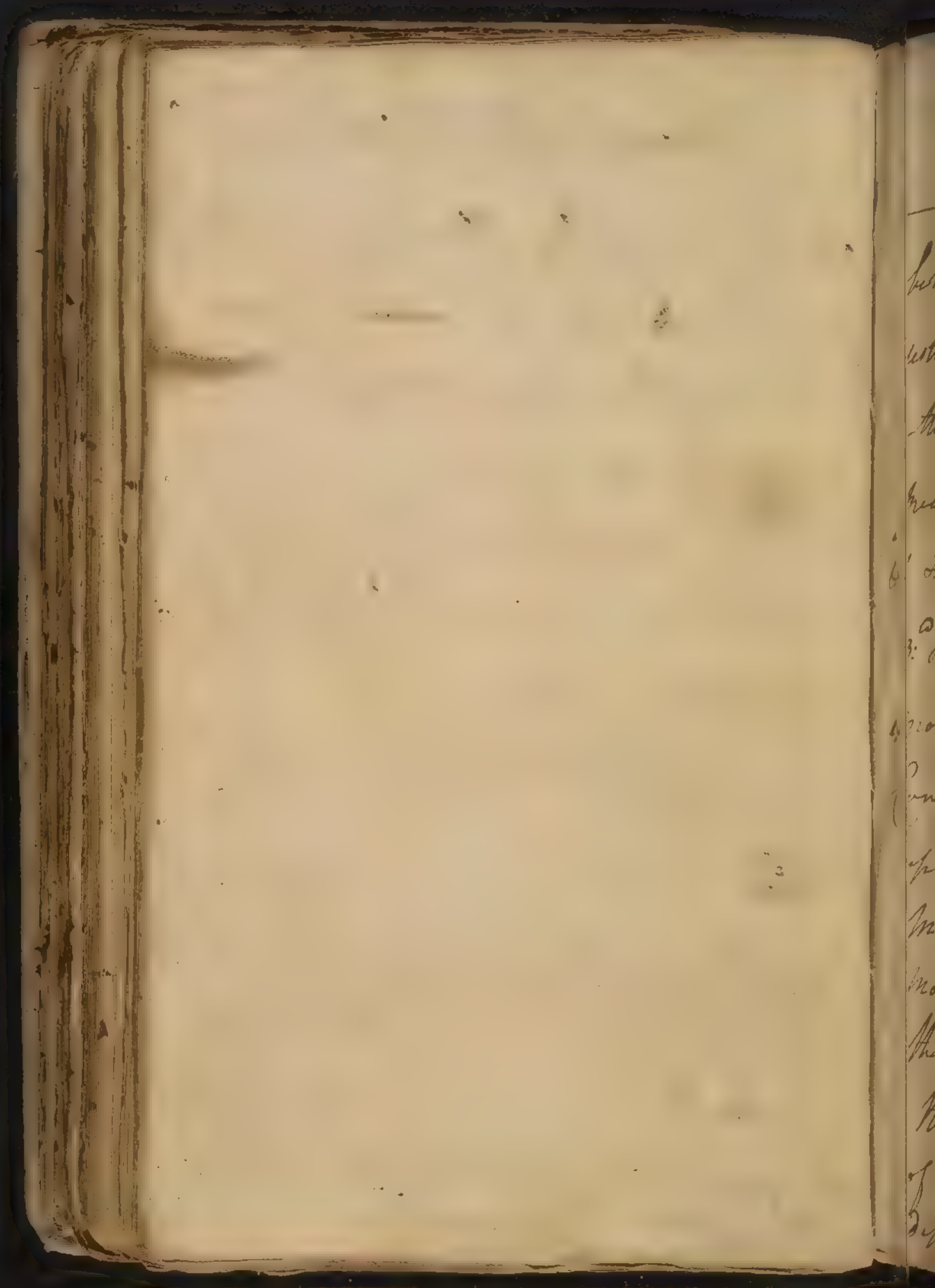




## Diseases of the *Folia dura*

See this more fully illustrated by Dr. Gaubius § 743. For ~~as~~ however much Authors may disagree in their Terms, they all agree in referring the morbid Cases of Irritability to Irregular Contractions of muscular Fibres whether convulsive or Spasmodic. Let us now enquire into the Cause of these Irregular Contractions.

- 1<sup>st</sup> They may depend upon a Morbid Affection of sensibility in <sup>e</sup>moving Fibres even while the state of <sup>e</sup>moving Fibres remain <sup>e</sup>same.
- 2<sup>nd</sup> They may depend upon Sensibility & Irritability being in an Excess or upon too great Mobility of the nervous Fluid, Or in other words upon the Proportion





## Diseases of the Solitaria.

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between Irritability & Sensibility being destroyed. in this case a weakness generally attends the Contractions. hence they are peculiar to weak Habits - young Persons & Hysterical women.

3.<sup>o</sup> They may depend upon the State of y.<sup>e</sup> moving Fibres themselves, without any Connection w<sup>th</sup> Sensibility. They depend upon a want of Tension, or upon too moveable Tension. Most of the irregular Motions we perceive in the System arise from these Causes. let us 1<sup>st</sup> enquire into the Diseases arising from a want of Tension. the most simple Affection depending on this Cause is premota Tension.

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## Diseases of the pelida trica <sup>337</sup>

Often depends on <sup>a</sup> weight apprehended.  
now if this is removed a Tremor nat-  
urally ensues. it would be easy to men-  
tion a hundred examples of Tremors arising  
from this Cause. Tension likewise depends  
on a Fulness of the Blood: vessels in  
particular Limbs. hence a Tremor  
of the Hand often follows Venese-  
ction. Universal Tremors also are often  
the consequence of general Hemor-  
rhages. Depletion may act too by  
taking off Tension from the Brain &  
thus diminishing the tonic power.  
The Passion of Fear acts in the same



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## Diseases of the Solida Viva.

way. in a word Tremor almost al-  
ways follows a want of Tension. it is  
more abundantly confirmed by our  
being capable of removing these  
Tremors either by weights appen-  
ded or by internal stimuli. Some Gour-  
mandisers who are so subject to  
Tremor can cure them <sup>themselves</sup> at once by taking  
a Dram w: acts by promoting Tension in <sup>the</sup> system.  
On what do these Tremors depend?

- I shall just Offer a Conjecture.  
perhaps on a want of <sup>density</sup> ~~extension~~ in;  
Other of our Nerves w: gives it a  
greater Disposition to Oscillations. This  
is confirmed by <sup>the</sup> analogy of Air & Other  
Fluids w: are always most mobile when most  
rare. <sup>no</sup>

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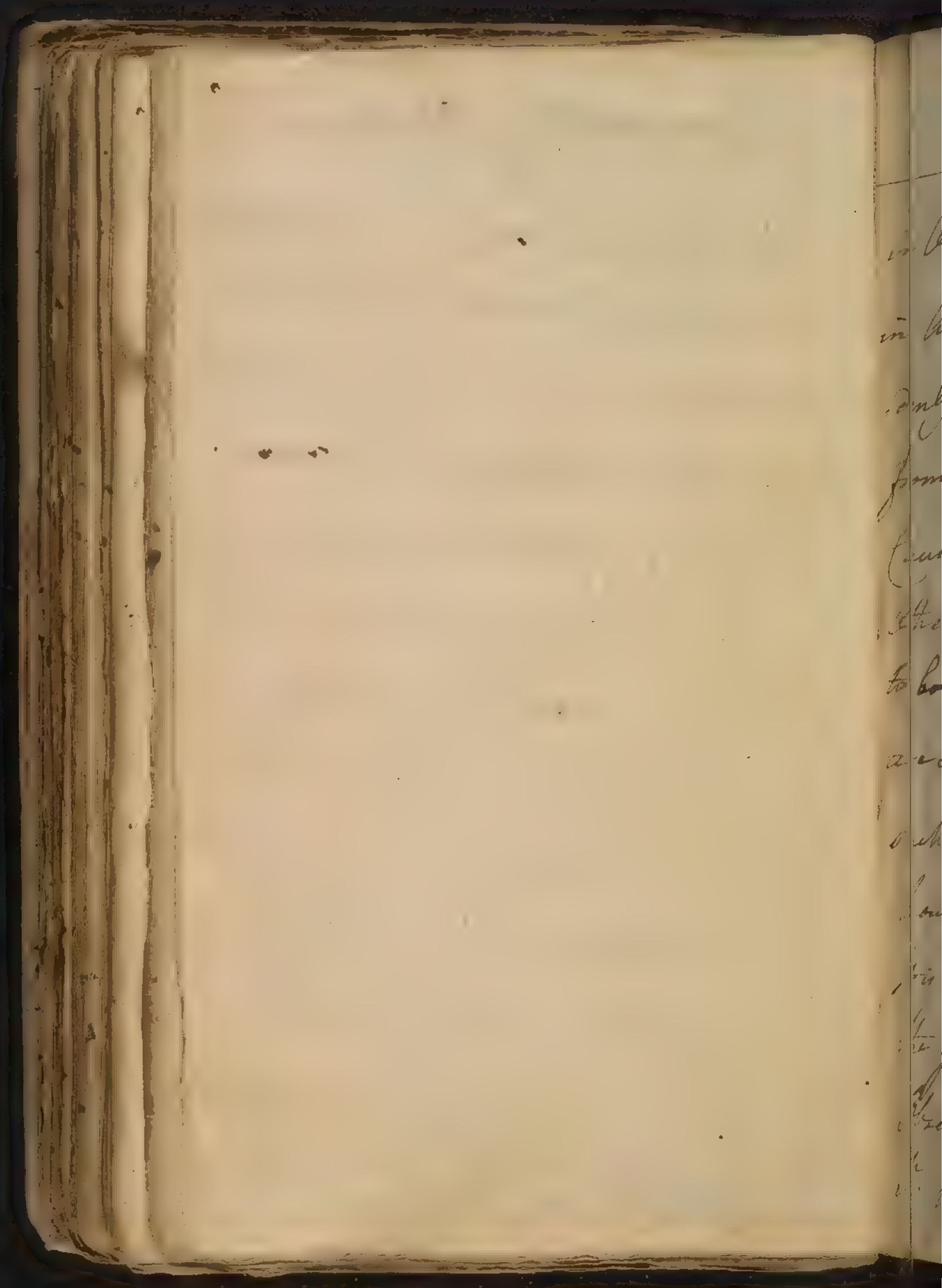


Diseases of the Solida tria.

339

2<sup>nd</sup> Convulsions <sup>ch</sup> w: are an Alternate  
Relaxation & Contraction of Muscles  
likewise depend on a want of Tension.

These are then nothing but Tremors in a  
higher Degree. Great Hemorrhages w:  
induce a general want of Tension often  
bring on Convulsions. perhaps their Opera-  
tion may be confined chiefly to their  
taking off the Tension & Excitement of <sup>2</sup>/<sub>4</sub>  
Brain. This seems still more probable  
when we consider that the same  
Causes <sup>ch</sup> w: induce Syncope likewise bring  
on Epilepsy or general Convulsions.  
- Thus Blood: letting w: brings on fainting



## Diseases of the Solida viva

in One Person will bring on Epilepsy  
in Another. I consider then the sud-  
denly taking off Tension or Excitement  
from the Brain to be the chief ~~to be~~  
Cause of Convulsions. perhaps some  
Other Causes may likewise contribute  
to bringing on Convulsions, but all these  
are such as Operate on the Brain  
such as exquisite Pleasure or pain.  
how they Operate is difficult to say.  
It is enough for me that I have established  
the general Proposition. I shall only  
observe further that all that causes  
it produce Epilepsy first produce



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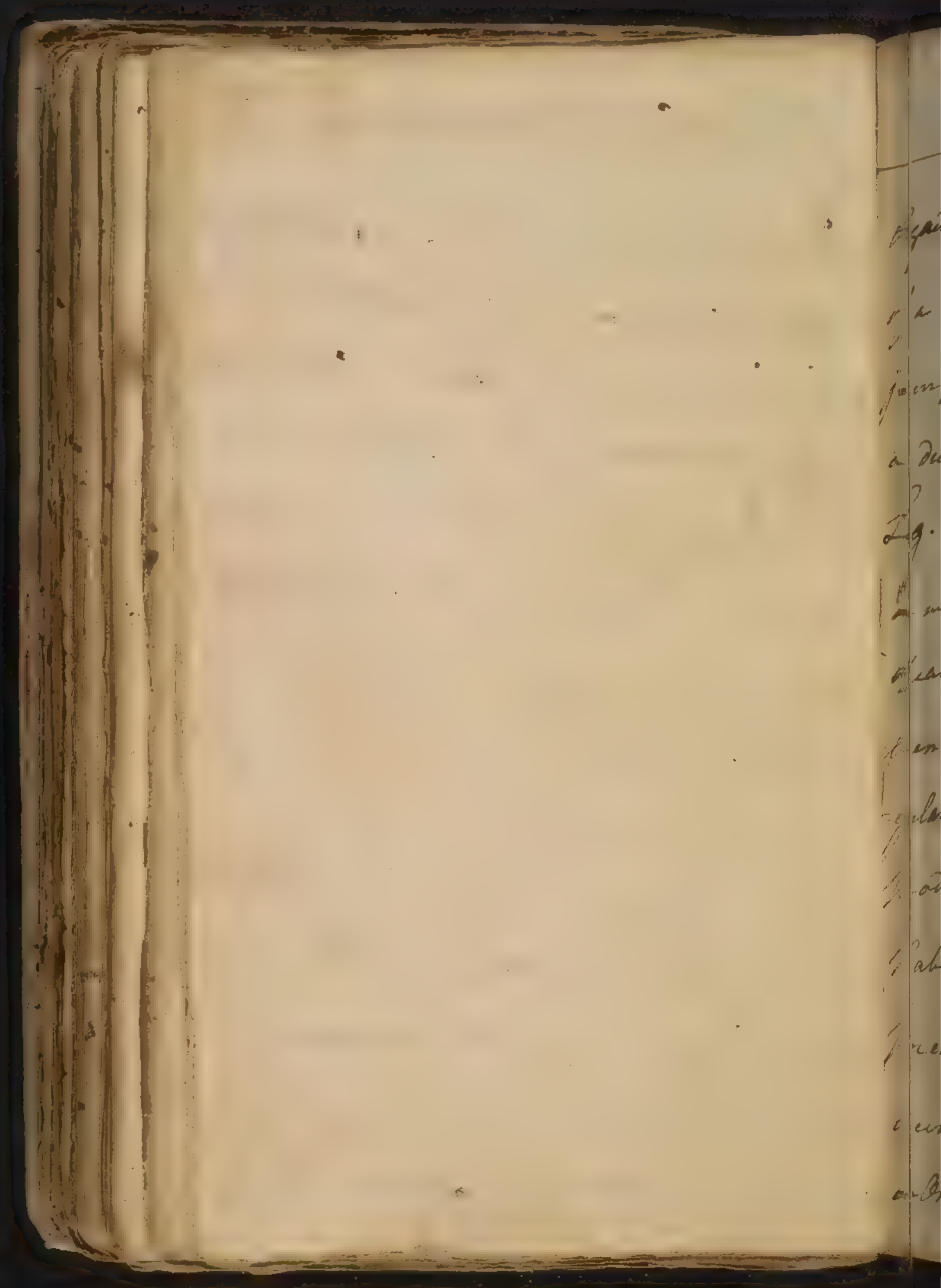
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## Diseases of the Solida viva.

a Deliquium animi <sup>is</sup> is an additional  
 proof of all Convulsions depending on a  
 want of Tension in the Brain. An <sup>it</sup> <sup>is</sup> does  
 3<sup>rd</sup> Spasm depend? it is nothing but a  
 higher Degree of Convulsions. or Convulsions  
<sup>is</sup> <sup>is</sup> do not readily admit of Alternation.  
 it is generally more or less mixed <sup>is</sup> <sup>is</sup>  
 Convulsions & almost always terminates  
 them. Spasm likewise depends on a  
 want of Tension as well as Convulsions.  
 thus we often see a muscle fall  
 into a spasm when the Antagonist mus-  
 cle is not in action. hence we find the  
Cramp is removed by keeping the root



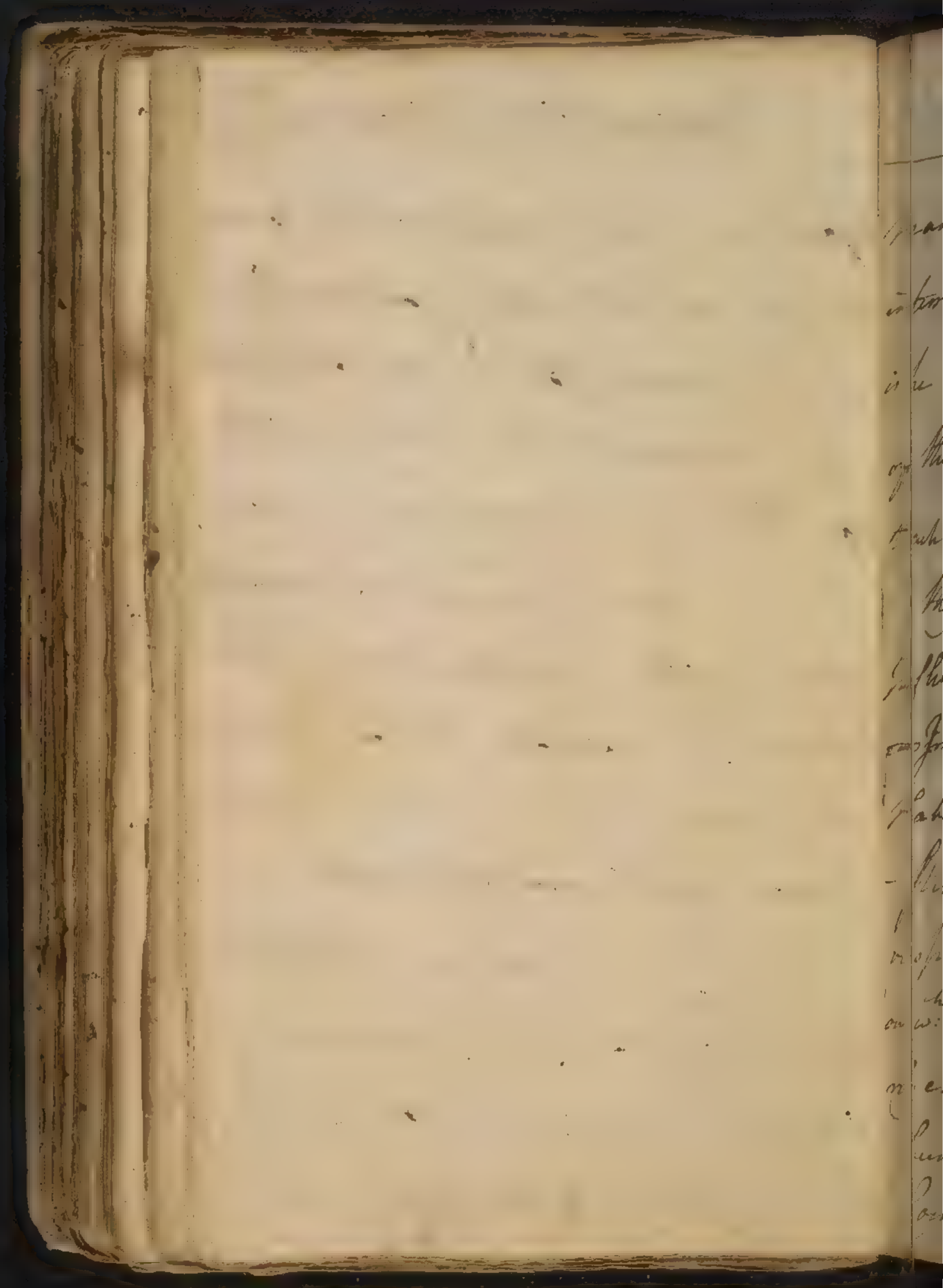


342

Diseases of the Polidivice.

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Against a Board placed at the bottom  
of a Bed, or otherwise suddenly  
jumping out of Bed, so as to restore  
a due Tension to the Muscles of the  
Leg. Other Causes may bring on Spasm  
as well as want of Tension of <sup>the</sup> we shall  
speak here after. To illustrate <sup>it</sup> has  
been said, I shall add that every Irre-  
gular Motion must increase itself &  
produce higher Degrees of Convulsions. By  
Habit all our Actions are fixed to a  
precise Manner of Performance - to  
a certain Velocity & a regular Succession  
in Order. Thus Every Man has his



343

## Diseases of the Solida viva

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manner of speaking, but if any thing interrupts this manner, how easily is he thrown into Confusion by the Balance of the System being destroyed! This will teach us how Stimuli produce Convulsions.

They act by bringing on an increased influx of the nervous Fluid & thus increase <sup>the</sup> irregular motions w: by time and Habit become natural to the System.

- Stimuli then act by hurrying the nervous power & thus bring on irregular Moti-

<sup>on</sup> w: in all weak Habits must necessarily increase themselves. What has

been said applies to all Cases of Convulsions depending on Mania



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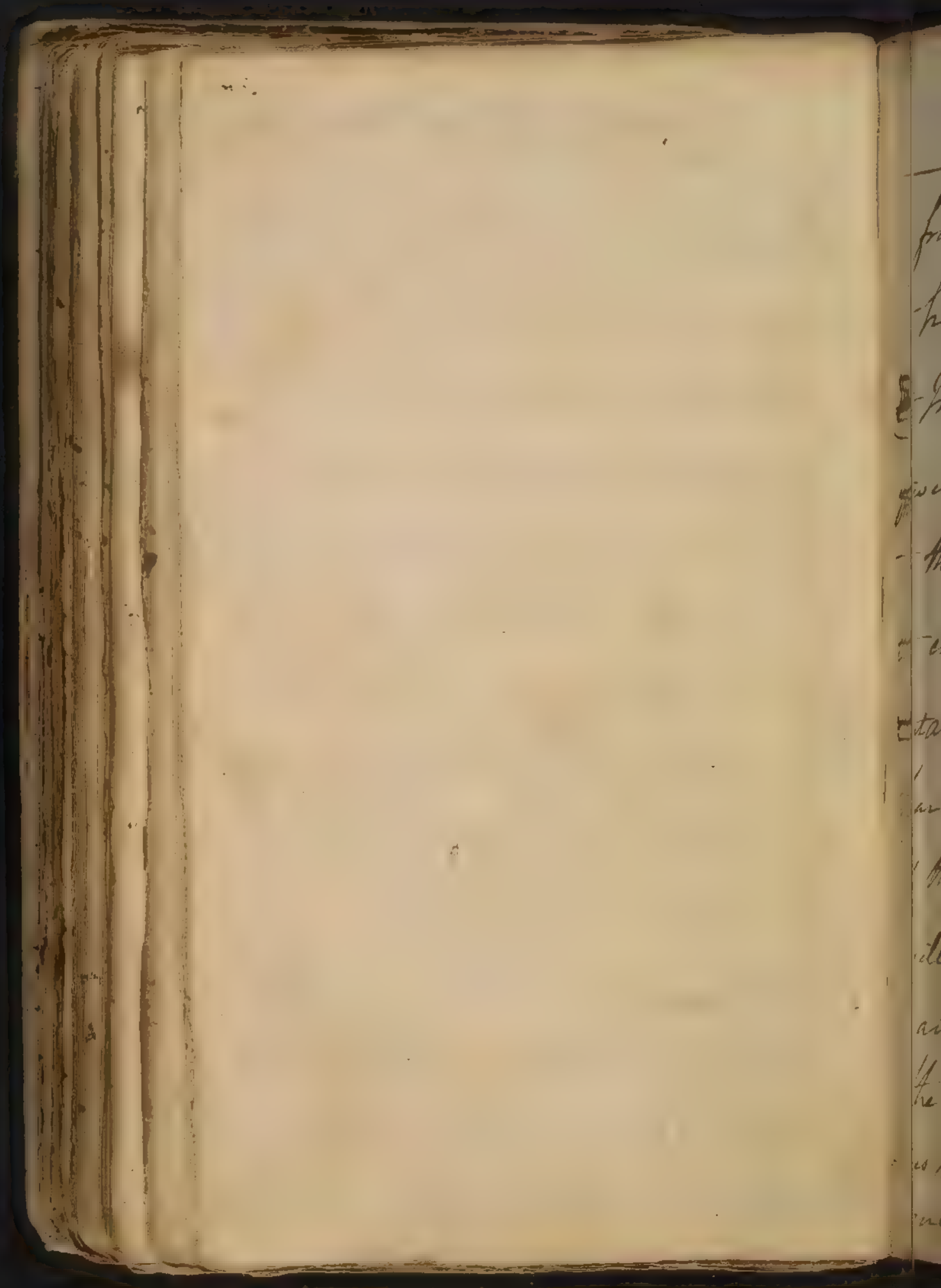
344

## Diseases of the foliacea viva.

<sup>not</sup> & Depletion. The first we have  
already considered. We shall now  
consider the Second. which we said  
formerly ~~was~~ cured by inducing too  
movable & exquisite a Tension in the  
system. as Depletion from Hemorrhages  
induces an Atonia so Repletion or a  
Rethoric state of the blood vessels gives  
a movable Tension <sup>or</sup> lays <sup>the</sup> foundation  
for a morbid Irritability.

1. This requisite Tension may depend on  
the mobility of the nervous system itself

But 2.<sup>nd</sup> It will depend on a too great  
fulness of the blood vessels arising





## Diseases of the Solida Viva

from a morbid laxity in the solids.

— Hence they easily yield to  $\frac{2}{3}$  Quantity  
& Impetus of the blood. This Pulse then

gives a very variable & moveable Tension.

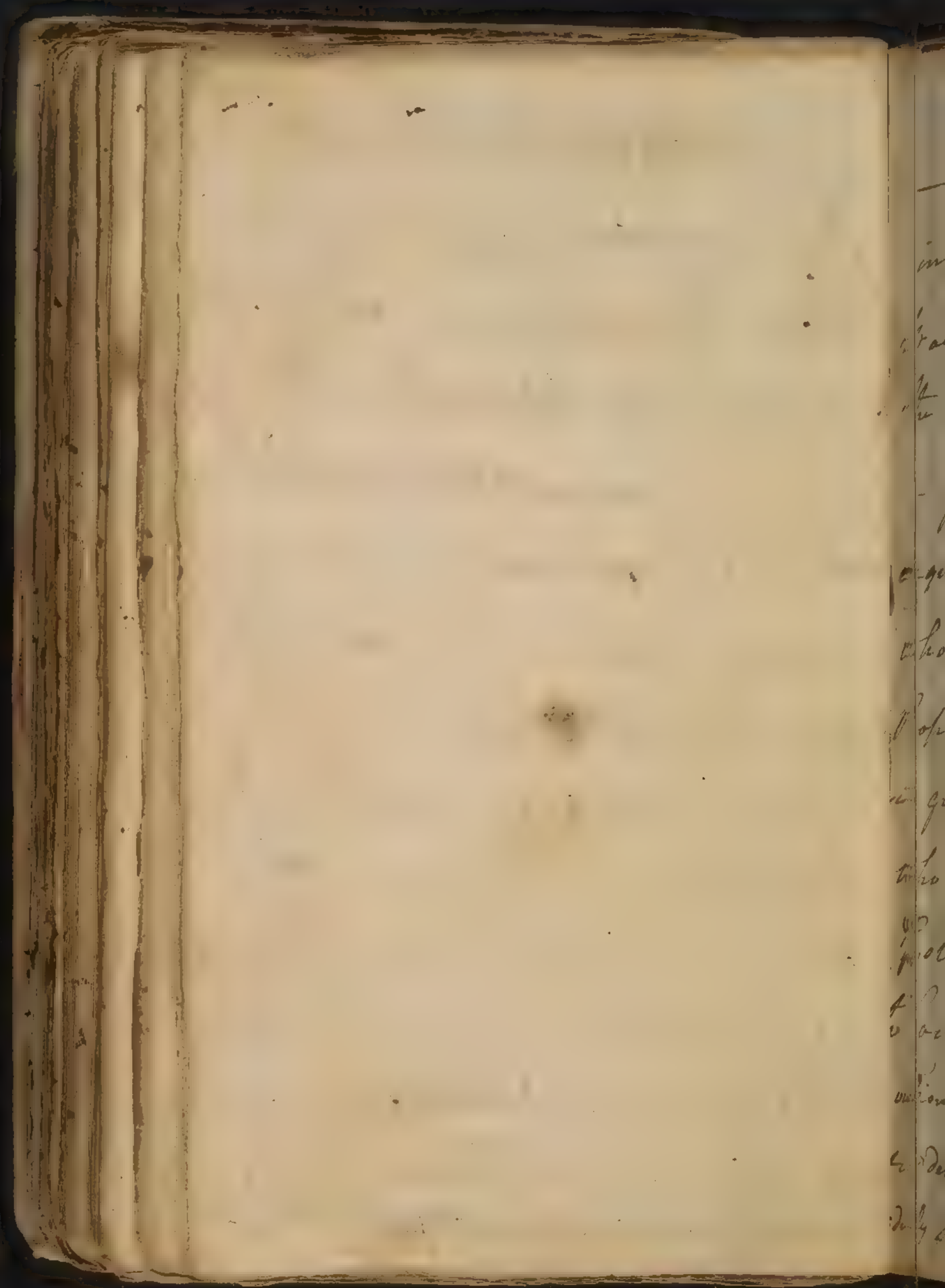
— This Laxity not only gives Occasion  
to exquisite Tension in  $\frac{2}{3}$  whole System.

But any thing that gives a Laxity to a  
particular part & increases the Impetus  
of the blood in it at  $\frac{2}{3}$  same time

will induce a Tension in a particular  
part of the Body. hence we find after

the Paracentesis a Deliquium Animi ex:

— arises much from the Tension being  
increased in one part & destroyed





346

## Diseases of the Solida Viva

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in Another. Small Alterations in  $\frac{1}{2}$  Balance of the System will always affect the Body in proportion to its mobility.

- In what Constitutions does such an exquisite Tension occur? In all Persons who have lax Solids especially in young People in whom the Impetus of the Fluids is greater than in Old People. Infants who have the most exquisite Tension of System are upon this Account most Subject to Convulsions. This Predisposition to Convulsions is always increased in Cases of very sudden Growth when the Solids are suddenly stretched, or when the Impetus of



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347

Diseases of the Solida Viva.

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The blood is such that the Solids do not  
give it to them.

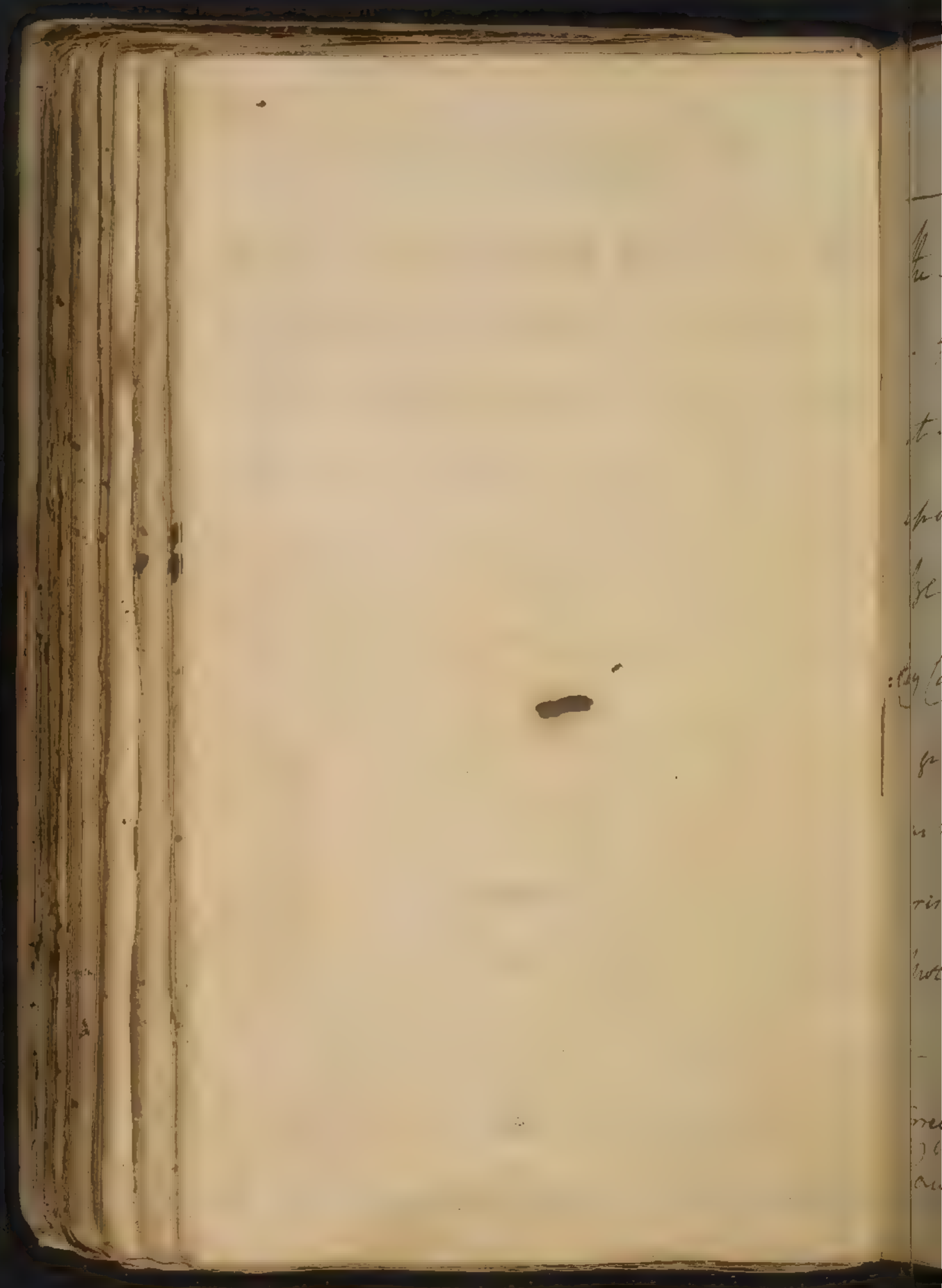
hence the great frequency of irregular  
Motions such as Chorea Sancti Viti &c  
in young People about the Age of  
Puberty. the Epilepsy in men & <sup>e</sup>  
Hysteria in women may be deduced  
entirely from ~~the~~ Causes. in women  
more especially there is a new source of  
vessels opened w<sup>ch</sup> gives Rise to a most  
exquisite & moveable Passion in one part  
w<sup>ch</sup> greatly influences the whole System especi-  
ally the Alimentary Canal w<sup>ch</sup> is y<sup>e</sup> seat  
of the Hysteria & w<sup>ch</sup> receives its blood. be-  
sides from the same great Branch as the





## Diseases of the Solida viva

Utens. Why do Hysteria & Epilepsy hap-  
 -pen in some Females & Epilepsy in  
 Others. The Diseases both occur in  
 the same Systems & depend on <sup>2</sup> same  
 Causes. They likewise depend on the  
 same predisposing & Occasional Causes  
 such as Plethora & the various Passions of <sup>e</sup> the  
 Mind. even in their symptoms they are  
 similar both occupying the same  
 Functions. nay they often unite in <sup>e</sup>  
 same Persons & at <sup>e</sup> same time. What  
 Circumstances determine the one to  
 affect the Alimentary Canal &



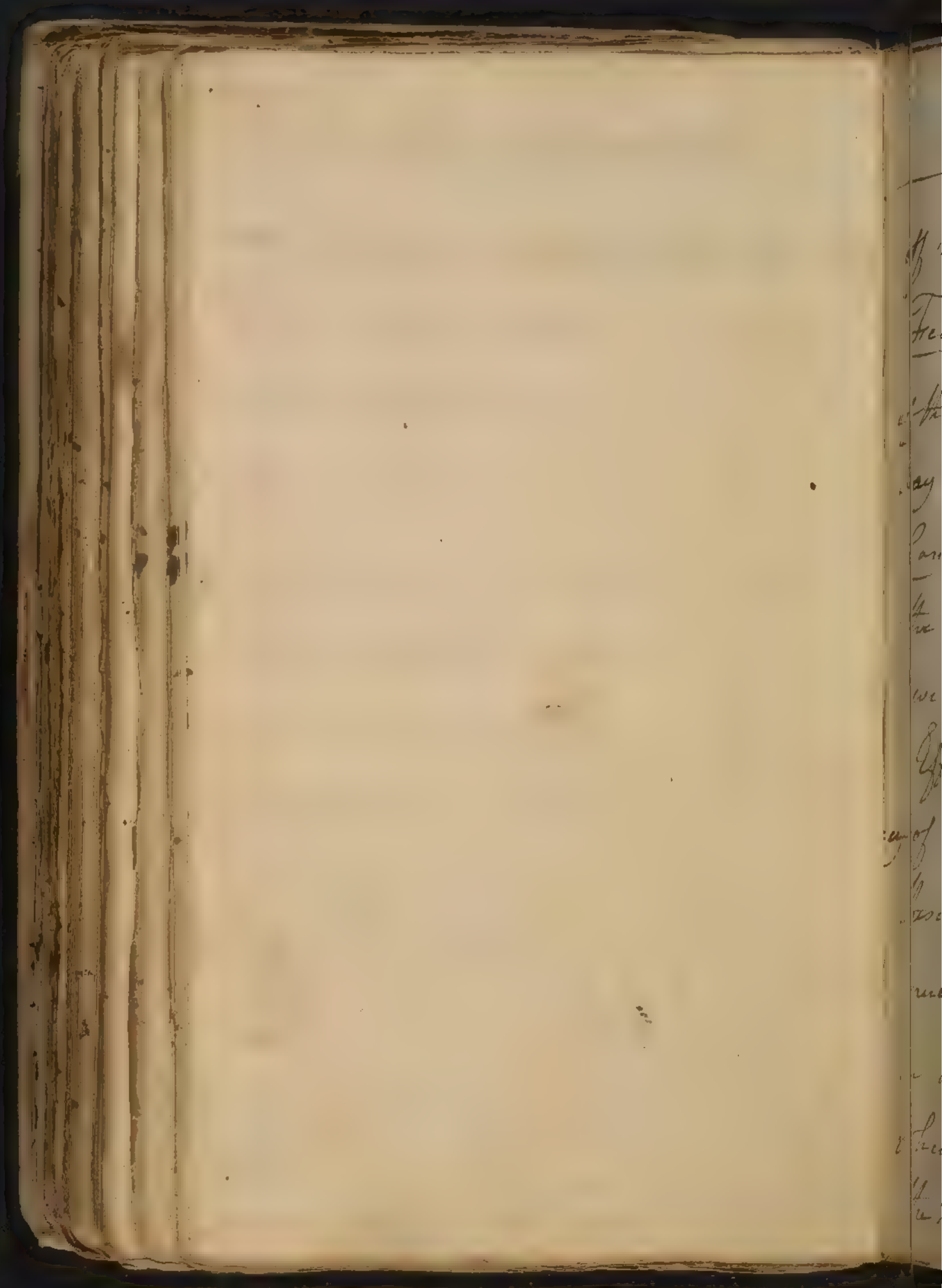
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## Diseases of the Solida Viva

Then the Vital & Involuntary Motions?  
- The Answer to this I have hinted  
at. It seems in the Hysteria to depend  
upon the Communication between the  
Blood-vessels of the Uterus & Ovarian  
Canal. The Hysteria is attended w<sup>th</sup> spasms  
gradually rising upwards in the same manner  
as the Epilepsy. But the Epilepsy always  
rises higher & produces its irregular  
Motions only by reaching the Sensorium.

- By what Circumstances are these  
irregular Motions bro't on? - Many  
Causes w<sup>ch</sup> induce them act by taking





Diseases of the folida viva. 350

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off the Excitement of the Sensorium.

Fear is the <sup>most</sup> common occasional Cause of them & this we are sure acts in this way. But ~~as~~ the Repetition of these Convulsive Motions cannot depend upon the Loss of Excitement in the Sensorium. we might indeed here call in the

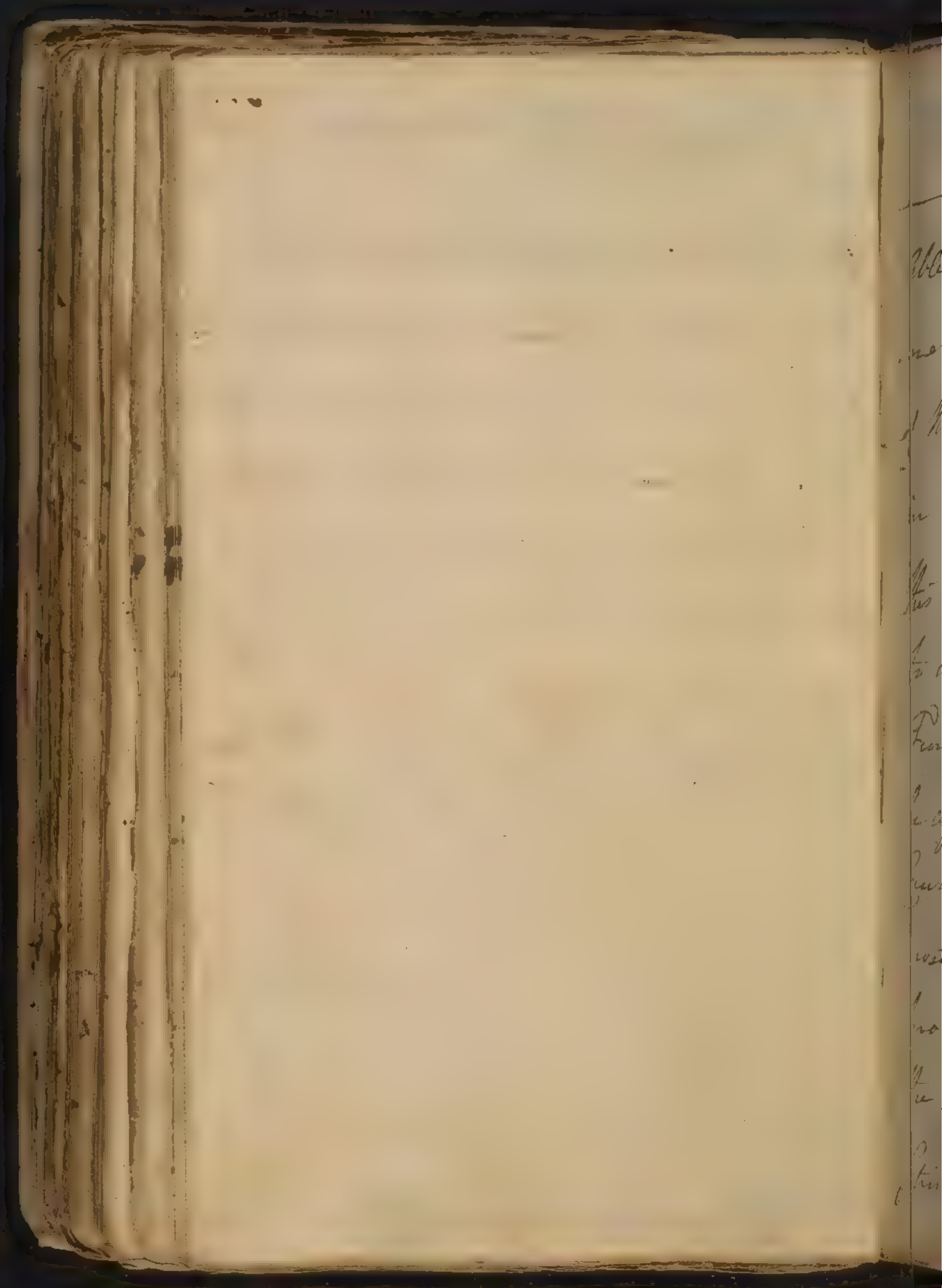
Effects of Habit to account for the Frequency of their Repetition. for we often find

these convulsive Motions occasioned

merely by Plethora itself without calling

in any <sup>external</sup> occasional Cause especially

when this Plethora is determined to the Head. Cases I have often seen

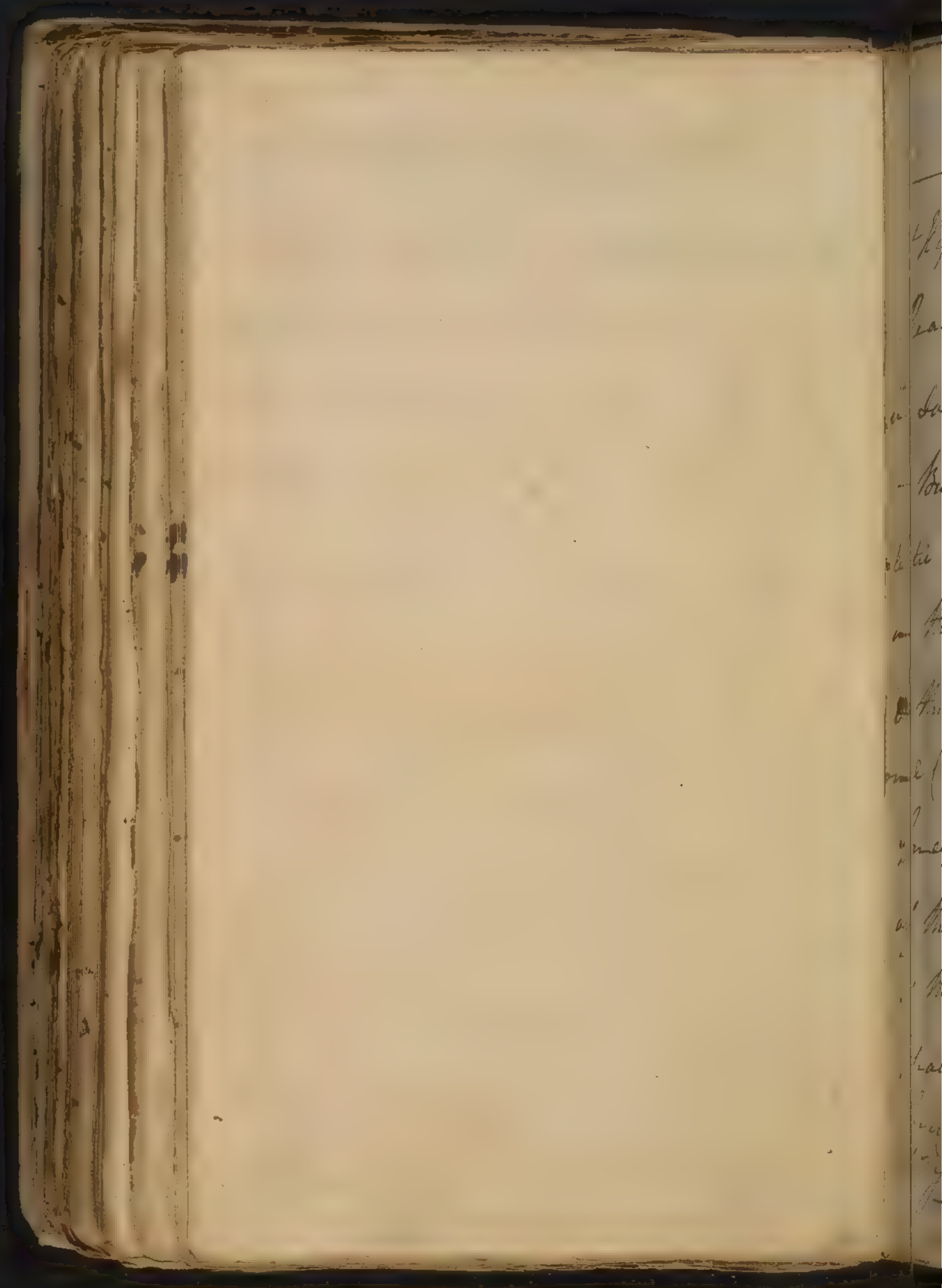




## Diseases of the folida viva

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able to foist an hysterical Paroxysm  
 merely from the Turgescence of  $\frac{1}{2}$  Cerebrals  
 of the Head. It is of great Importance  
 in the Practice of Physic to attend to  
 this Observation. The Rethora seems  
 to act by inducing a too exquisite  
 Tension of the System <sup>or</sup> disposes it to  
 be affected by the slightest occasional  
 Causes, the Blood is after determined  
 most to one part of the brain. This  
 produces an Inequality of Distribution in  
 the Blood. Cause <sup>or</sup> may act as a  
 Stimulus & thus bring on Epilepsy &



352

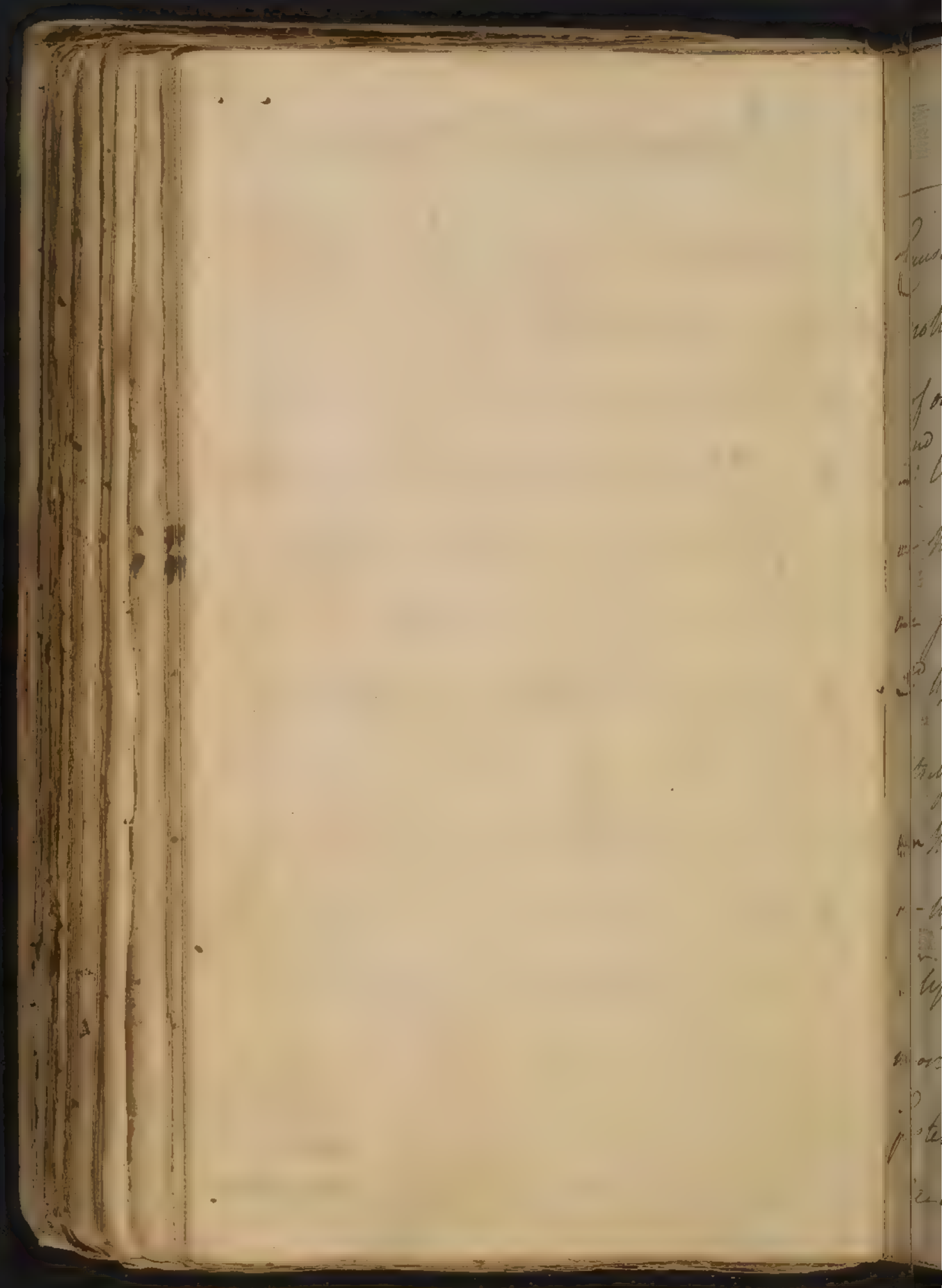
Diseases of the folida viva.

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& Hysteria. we may from the same  
Reasons account for the Convulsions  
<sup>or</sup> sometimes attend<sup>a</sup> partial Phrensy.

- But further in many dissections of Epi-  
leptic Patients we find Fibrils & Ossifications  
in the Brain. These may act as stimuli  
& thus joined w<sup>th</sup> Plethora prove an Occasi-  
onal Cause of Epilepsy by inducing an  
Inequality of Tension in the different parts  
of the Pericranium. This finishes our list  
of the morbid causes of Irritability. I  
shall only here repeat the Causes w<sup>ch</sup>  
bring on irregular Motions. They are  
Stimuli w<sup>ch</sup> act without any ~~causation~~  
meditating





## Diseases of the Solida viva

Cause ~~not~~ merely by producing hurried motions, <sup>in</sup> w: destroys the Order & Velocity of our Actions. But they may depend

2<sup>nd</sup> On very great Immobility <sup>in</sup> w: acts in the same manner as the stimuli

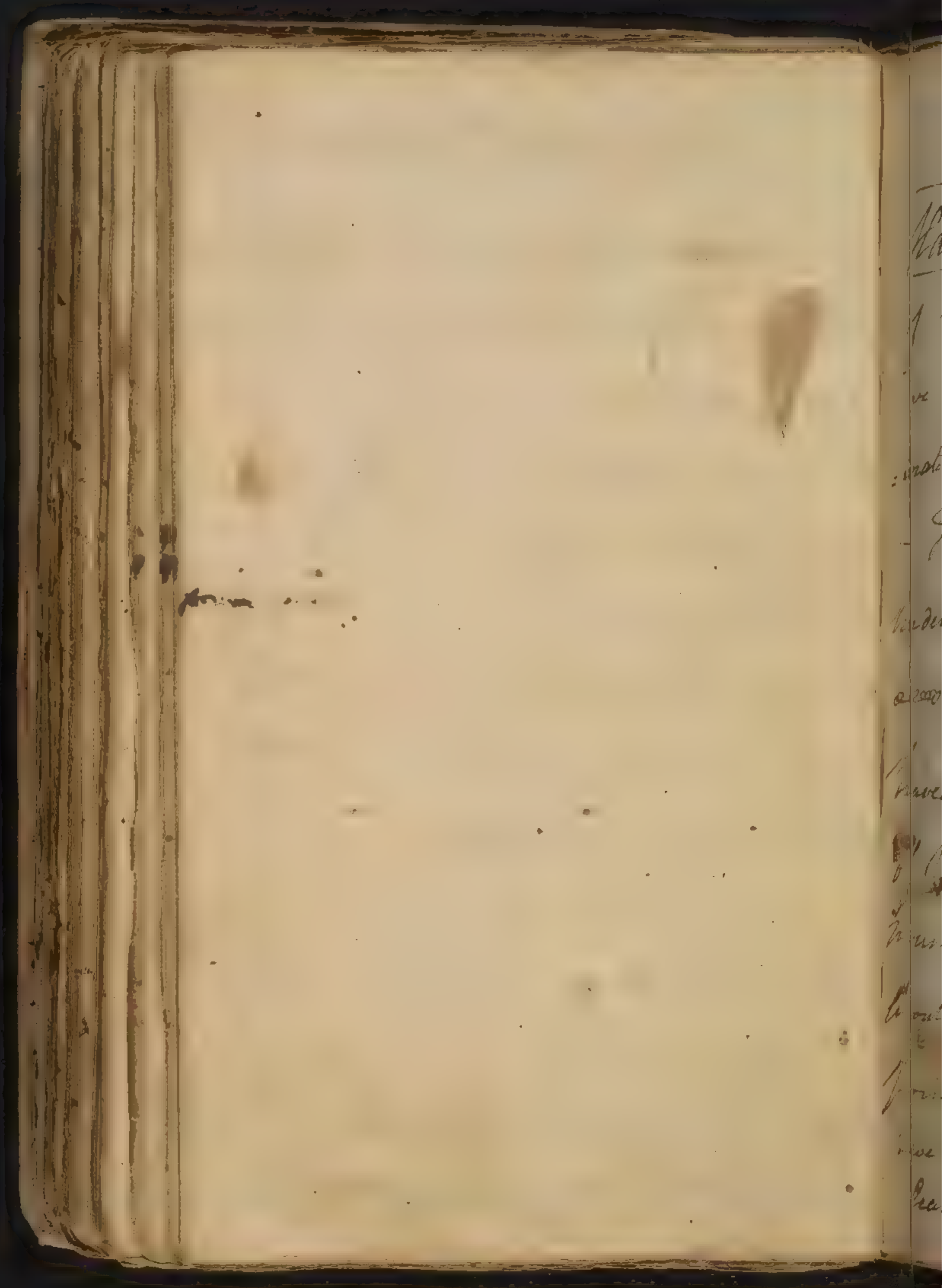
w: shake off, & is not connected w: <sup>the</sup> increased <sup>mobility</sup> ~~mobility~~.

3<sup>rd</sup> Upon the mobility of the nervous system itself depending upon the nervous & other ~~for~~ the Nerves themselves

4 - Upon a want of Tension in <sup>the</sup> system

5<sup>th</sup> Upon too exquisite Tension. This is y<sup>e</sup>

most frequent Cause, as it exposes the System to be affected by a thousand occasional causes of irregular Motions.





Diseases of the Fluids.

354

Having now treated of the Diseases  
of the Solids, both simple & nervous,  
we shall go on to consider the proxi-  
mate Causes of the Diseases of the Fluids.  
These ~~at first sight appear more~~ simple & easier  
understood than the Diseases ~~of the Solids~~  
of the Solids, But notwithstanding they  
have been the subjects of the Inquiry  
of Pathologists for 2000 years I  
must say we know but very little  
about them. All I shall aim at is  
pointing out the Errors that Authors  
have introduced here. Thus will the way be  
clearer for further Discoveries.

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## Diseases of the Blood

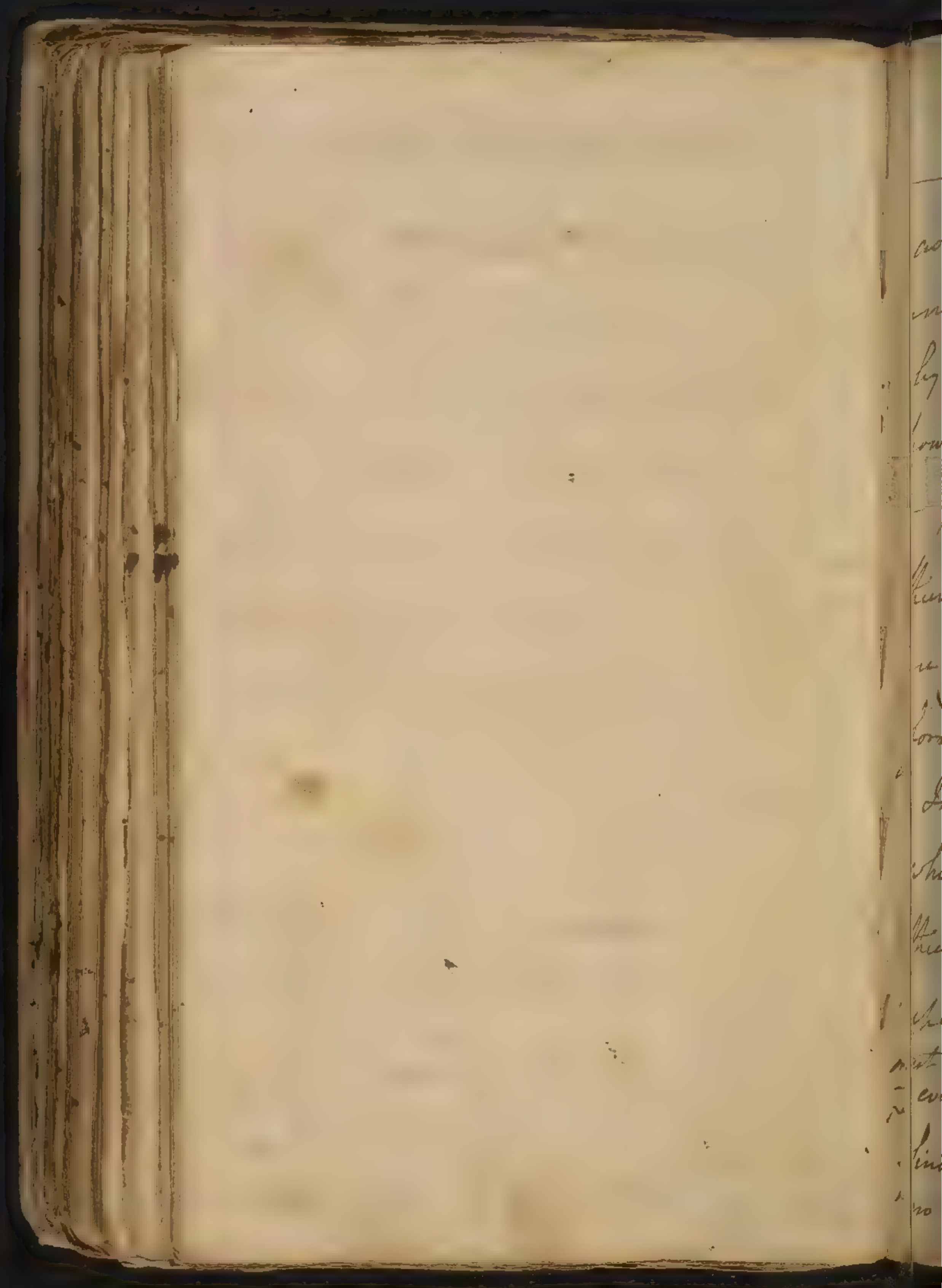
I shall first consider the Diseases of the common Mass of Blood. These either respect the whole Heterogeneous Parts of the Blood or the several Parts of <sup>it</sup> it is composed: we shall begin <sup>with</sup> the first. The Blood we know is of a Middle Degree of Fluidity not so fluid as water, nor so viscid as many Liquors. we shall begin with considering the Excess in viscosity or Lentor of the Blood. - the Consistence of the Blood may depend upon the different proportions of its constituent Parts, & 2<sup>nd</sup> upon the Quality



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## Diseases of the Blood

of these parts. Its Diseases will depend upon an Excess or bad Equality of either the Red Globules or Coagulable Lymph. It is hard to ascertain the exact proportion of the Red Globules as we never can get them entirely separate from the Coagulable Lymph. even the Coagulable Lymph too always carries w<sup>th</sup> it a considerable Quantity of Serum. Some have supposed that an Excess of the Quantity of the Red Globules might be determined by their Specific Gravity as they alone are heavier than water. But this cannot be done





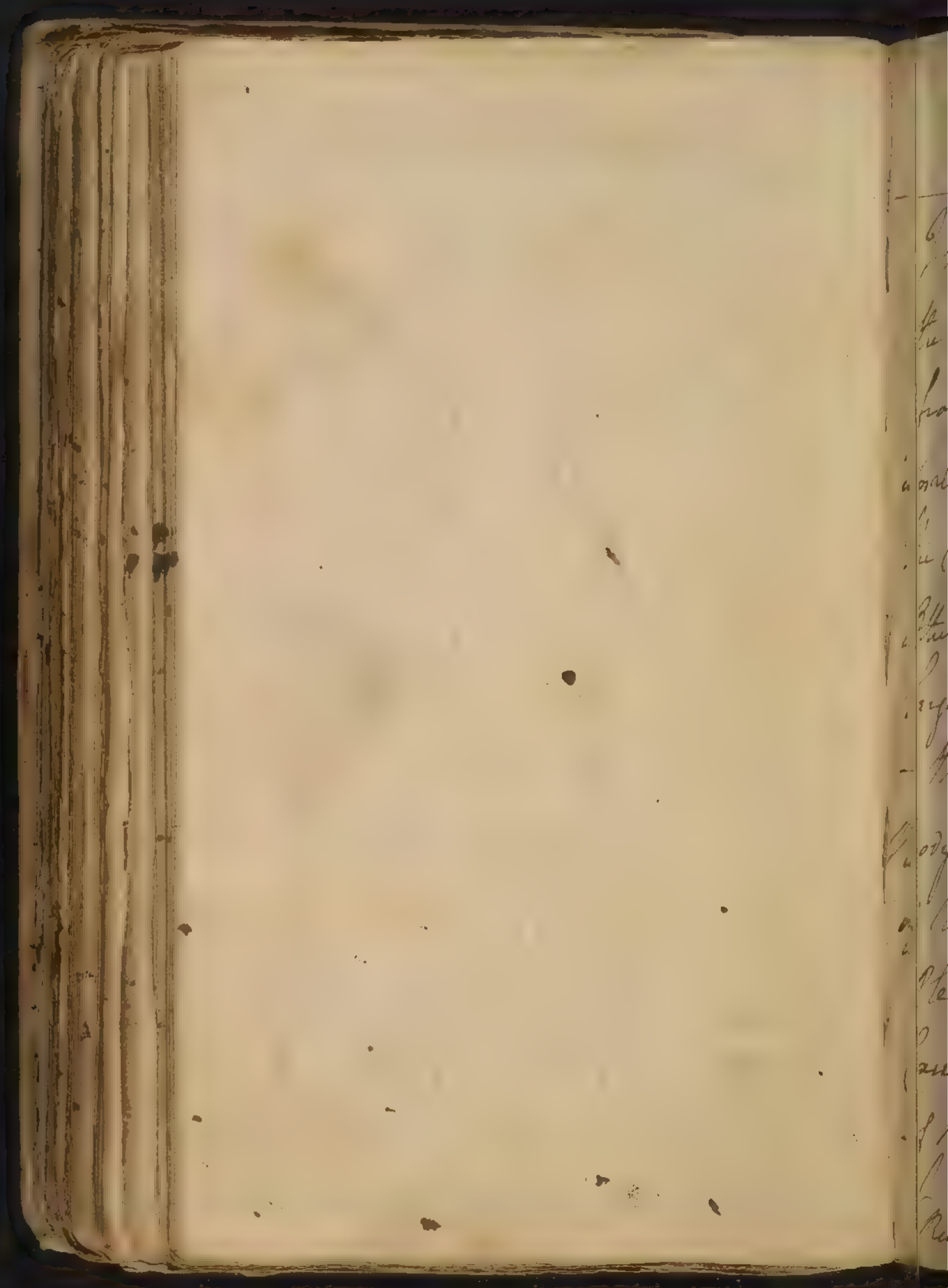
## Diseases of the Blood

357

as we cannot Obtain them in a pure  
state, nor can we measure them  
by this Bulk as we never can tell  
how much Kalitus escapes from them.

- Nor can we form any Judgement of  
their Quantity from their Causes. we  
are ignorant in w<sup>t</sup> manner they are  
formed, or w<sup>t</sup> Aliment gives them most.

- In general they abound most in those  
who are most healthy & vigorous so that  
their Quantity may in some measure  
depend upon the powers of Assimilation.  
But even this is liable to Fallacy as we  
find them in the Chick in Ovo where  
no strong Assimilating powers are Observed.





## Diseases of the Blood

I have here formed a Conjecture. all  
the Fluids of our Body would escape  
from the Blood: vessels, however

small we may consider <sup>them</sup>, was it not for

the Red Globules which confine the  
Other Parts of the Blood as being too  
large to pass thro' the Blood: vessels.

- the Pulses - Tension & Growth of <sup>2</sup>

Body then may depend upon the presence

of Red Globules in the Blood. Hence the

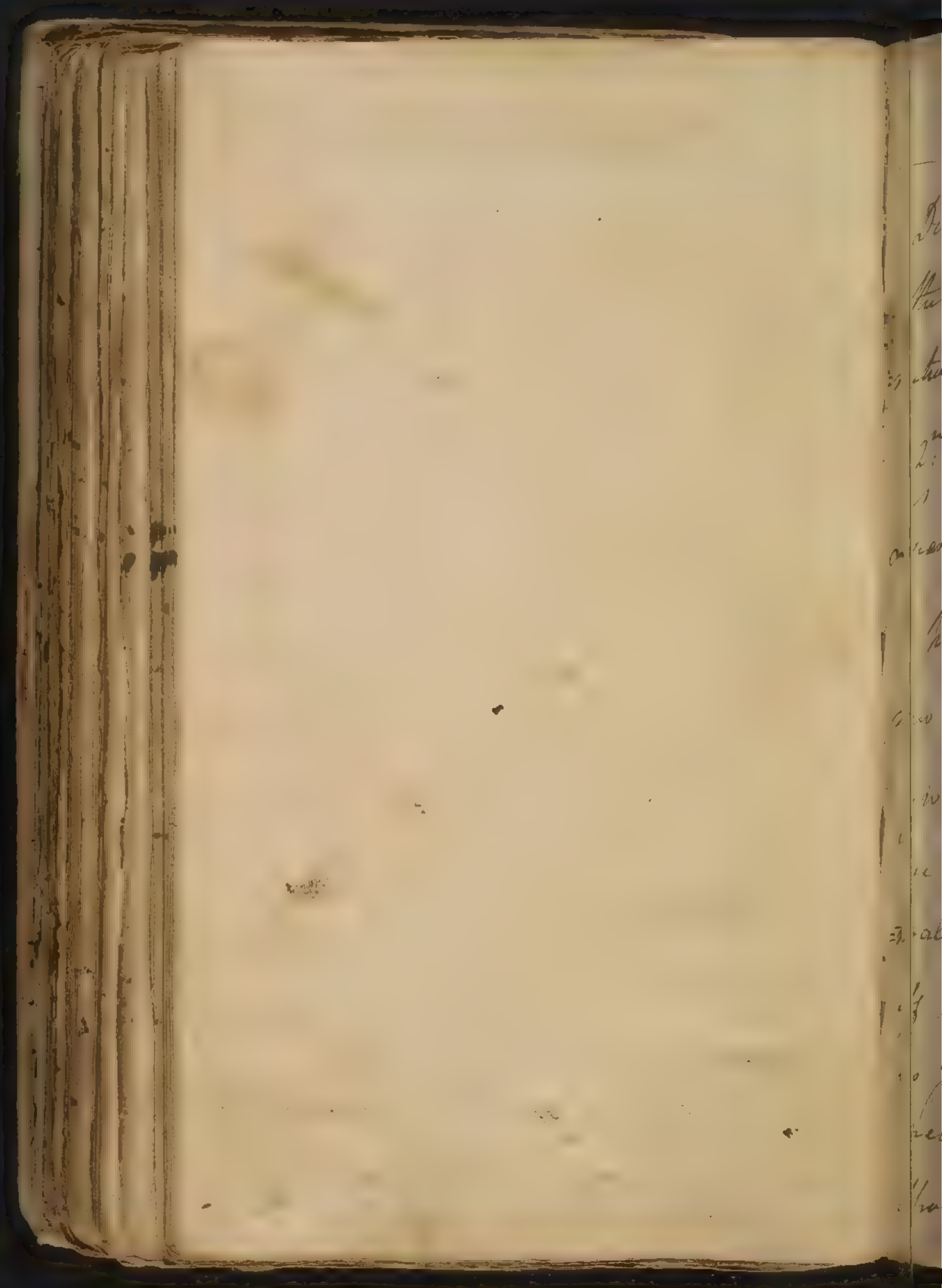
Pléthoric state may be considered as <sup>2</sup>

Consequence of an Excess in the Quantity

of Red Globules. see Dr. Gaubius § 356.

I do not imagine this Quantity of  
Red Globules can dispose to Inflamm:



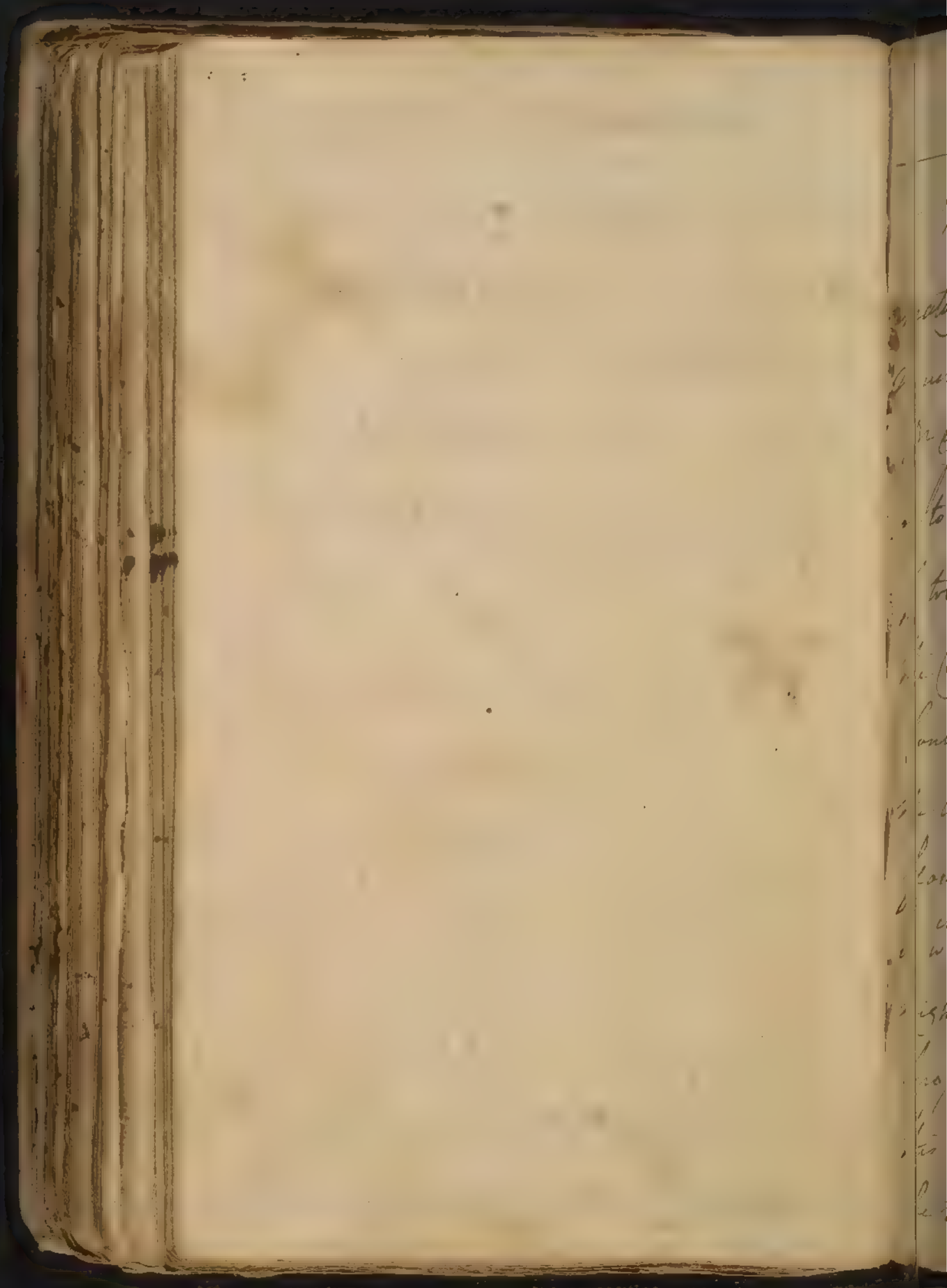


## Diseases of the Blood

359

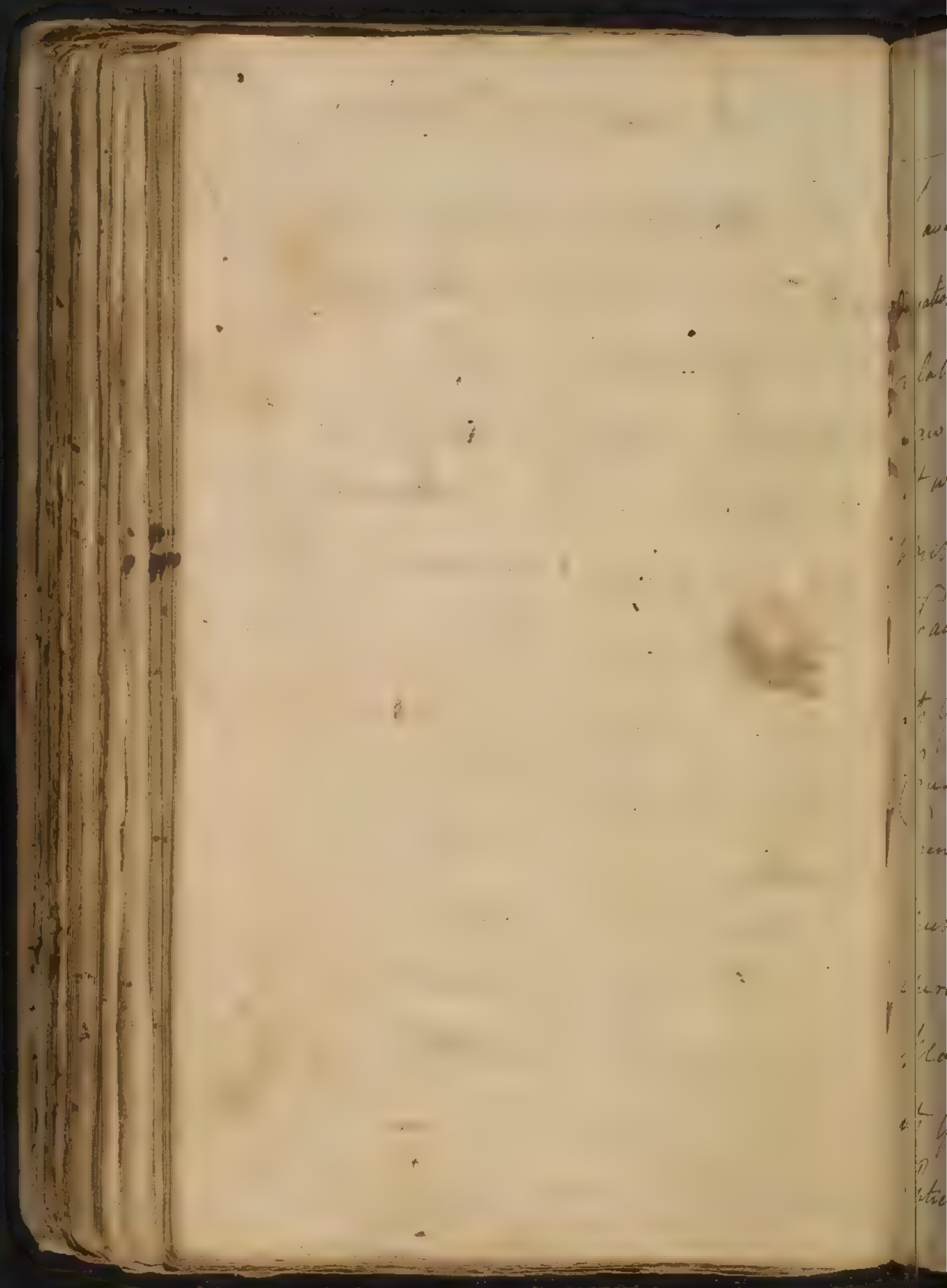
Diseases. These depend entirely upon the Plethoric state induced, & have no connection with the state of the Fluids.

2<sup>nd</sup> we come now to speak of the Quantity or Quality of the Coagulable Lymph. - how shall we judge of this? here new Difficulties occur. Blood: Letting give us no Light in this Question. we are ignorant of the proportion of it <sup>in</sup> is natural to the body. No one that I know of has yet attempted it. we can form no Judgment from its density as we never can tell to what Degree the Spontaneous Separation has taken place.





The Appearance of  $w$  is called Inflammatory Crust is no less fallacious, however much Physicians may infer from it. Even Dr Gaubius himself in §367 has fallen into this Error. This Inflammatory Crust told you formerly depend entirely upon the Circumstances of the Blood's Operation. Could we measure the Temperature of the Air - the velocity  $w$   $w$ : the Blood flows from a vein & the given time in  $w$ : Blood always coagulates, then we might form some judgement of the Over proportion of the Coagulable Lymph, but this Experiment has not, nor indeed can be tried  $w$  any decisive manner. We





## Diseases of the Fluids.

361

have many cases of very sudden con-  
versions of the blood. One in particular  
related by J. M. A. who tells us that he once  
saw blood coagulate in a stream while  
it was flowing from the arm of a man.  
But for my part I cannot admit these  
facts. If any thing will determine  
its quantity or proportion it must be by  
causes which induce them. Dr. Gaubius  
mentions several causes <sup>which</sup> increase it  
such as Inflamm. & fever, but these causes  
operate only by altering the mixt of the  
blood & never produce any change upon  
its quality. I have seen an epileptic  
Patient bleed one day & found his blood



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entirely dissolved, & yet the Day after  
it had the Appearance of natural Blood  
w<sup>th</sup> a considerable Buffy Coat. I think  
then we must always refer the Pha-  
nomena of the Blood to  $\frac{1}{2}$  Circumstances  
of the Circulation rather than to any  
Changes in the Nature of the Blood.  
- But Other Causes do influence the  
Quantity of Coagulable Lymph particularly  
Aliment especially when we add to this  
a due Degree of Vigour in the Assimilating  
power. for vigorous assimilating  
power always gives the densest Fluids  
& vice versa. the proportion of Coagulable

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## Diseases of the Blood

363

Lymph is increased w<sup>th</sup> Life. we cannot establish the Presence of Diseases from its Quantity or Quality, as different Men require different proportions of it according to their Manners of Life. When it is excessive in Quantity, the Solids become proportionally rigid & thus resist any Diseases that might arise from it, & vice versa by w<sup>ch</sup> means the Solids & Fluids are always kept nearly in a Balance to each other. But further another Cause appears to increase the Coagulable Lymph & dispose it to be <sup>more</sup> quickly dissolved in the serum, so that an Error in the

(c). By this means those morbid  
affections <sup>in</sup> might arise from an  
increased Quantity of Lymph in  
consequence of animal Food are  
constantly obviated viz by the quick  
or solution of the Lymph in the system.



Quality of the Coagulable Lymph may be derived from the excessive use of Animal Food - hence we find those who live most on Animal Food are most disposed to putrid Fevers. (a)

But even supposing the Coagulable Lymph was excessive, yet such is its power of retaining water than it would soon receive a sufficient quantity of it to restore the proportion it ought to bear to Serum, or the watery parts of the Blood. (a)

Plthora then can only be induced by such an affection of the Lymph, & not a mere temporary Spicitude.

Some have supposed that certain Substances of a viscid nature gives an



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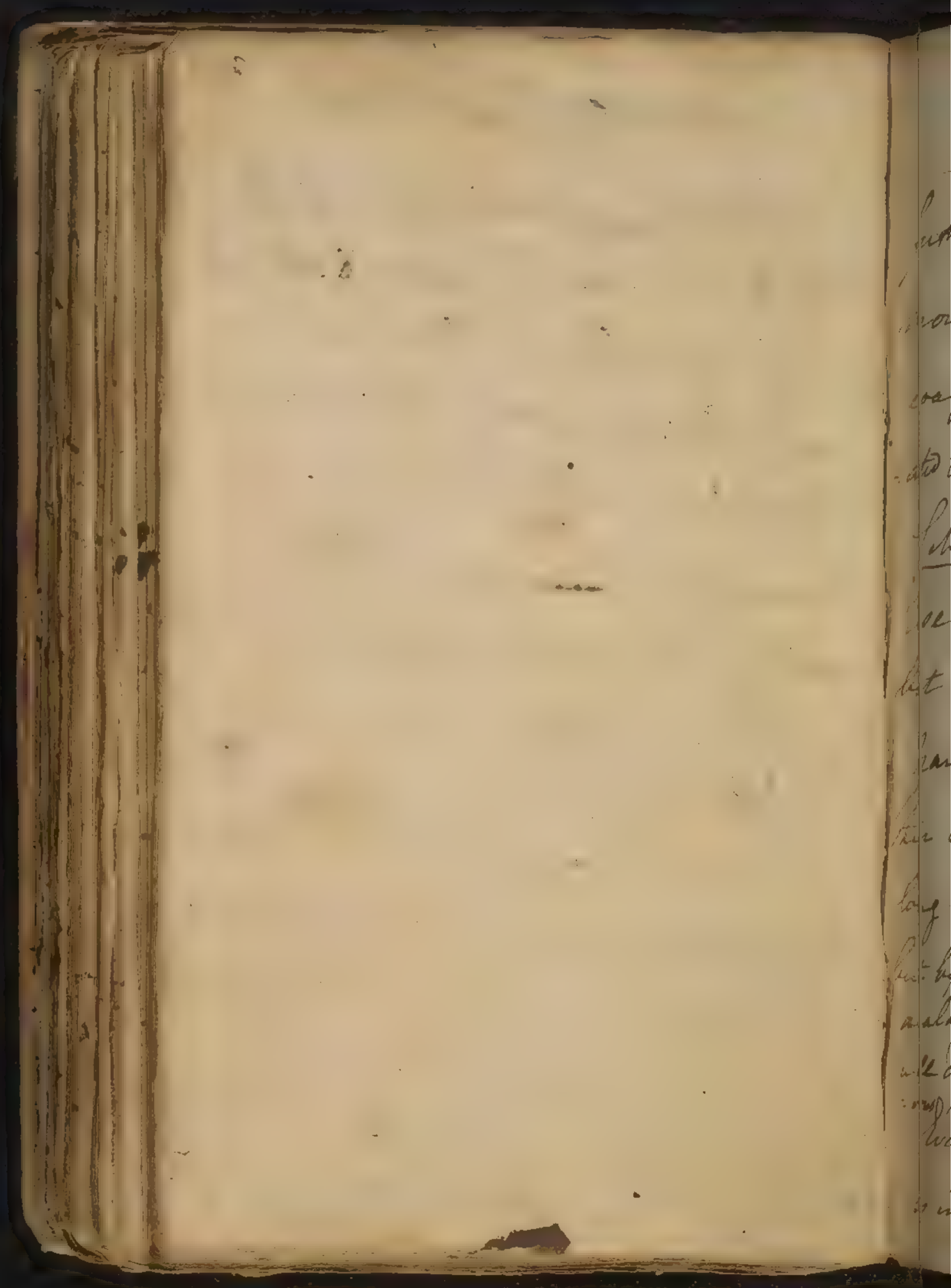
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## Disorders of the Blood

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increased Quantity & Density of the co-  
agulable Lymph. See Dr Gaubius § 367. upon  
this Subject, where he attributes an  
increased Density of the Blood to certain  
Astringents & spirituous Substances. These  
Substances have ~~some~~ such Effects when  
directly injected into the Blood, but  
deny their being able to produce any  
such Effects when taken in in <sup>the</sup> ordinary  
way mixed w: our Diet. Even Liquors  
& Alcohol are capable of coagulating  
our Fluids only in a very concentrated state.  
now we are sure they never can  
reach the Blood in any other way.  
but in the most diluted state. the

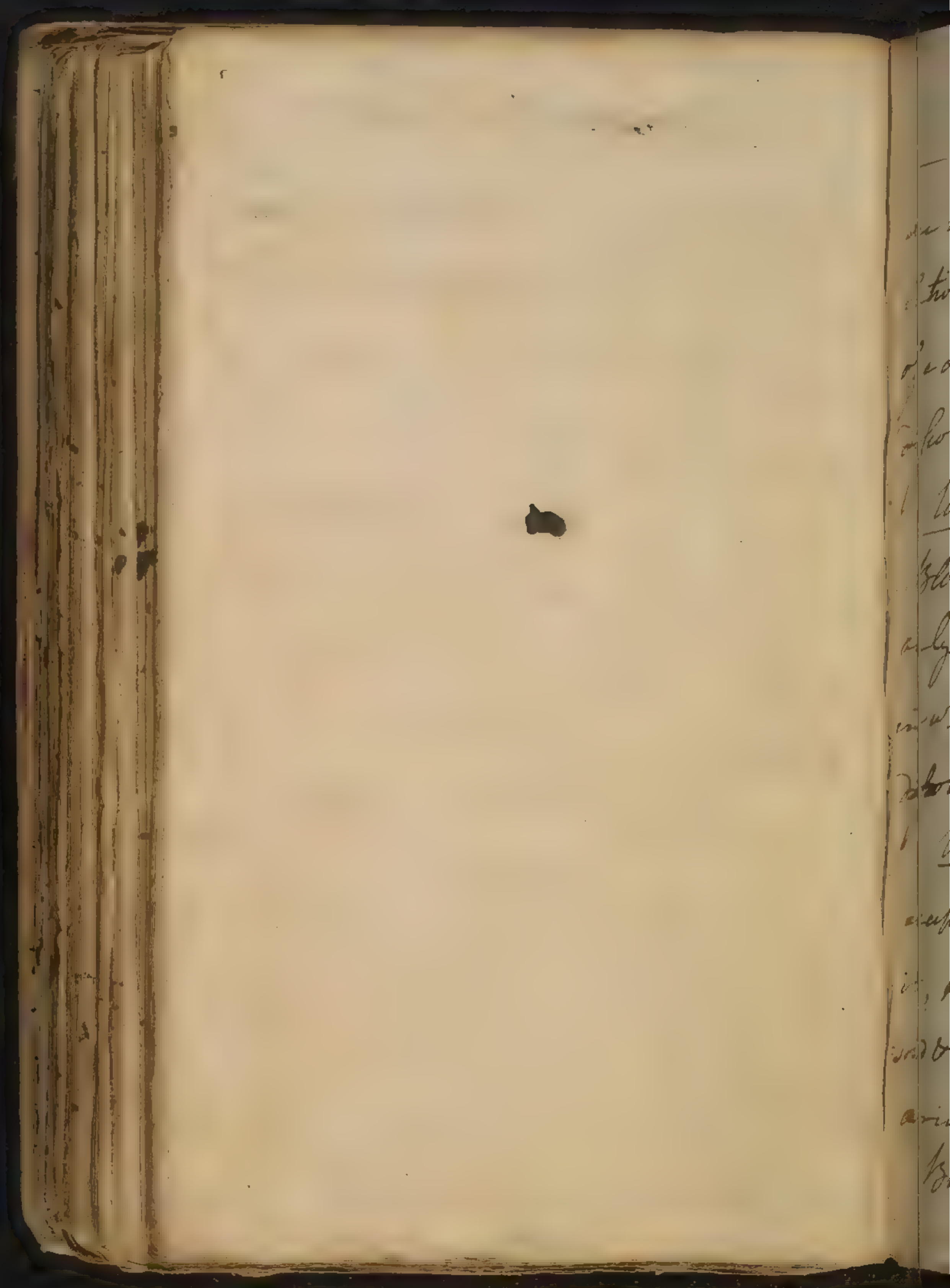




## Diseases of the Blood

further they go in the Primæ Viæ, &  
 more they become diffused, & thus their  
 coagulable Qualities are entirely Abor-  
 ated long before they arrive at the Blood.  
Scirrhi have been attributed to the  
 Use of Spirits in some of the viscera.  
 but these Scirrhi depend rather upon the  
 narcotic power of the Spirits than upon  
 their coagulating the Fluids. Opium has  
 long been supposed to Operate on the Fluids,  
 but by long Habit it produces Effects exactly  
 analogous to Spirits. its Operation then as  
 well as that of Spirits is confined only to the Ner-  
 vous System.

even Acids when combined w<sup>th</sup> Metals  
 as in Corrosive Sublimate, in w<sup>ch</sup> they





## Diseases of the blood

are most concentrated excite no other action but that of stimulating, & instead of coagula: as some suppose, they rather dissolve the fluids.

Lacta cannot enter into our blood except when dissolved. It ~~it~~ can only be dissolved into a saline form in which state they rather than ~~it~~ coagulate the blood.

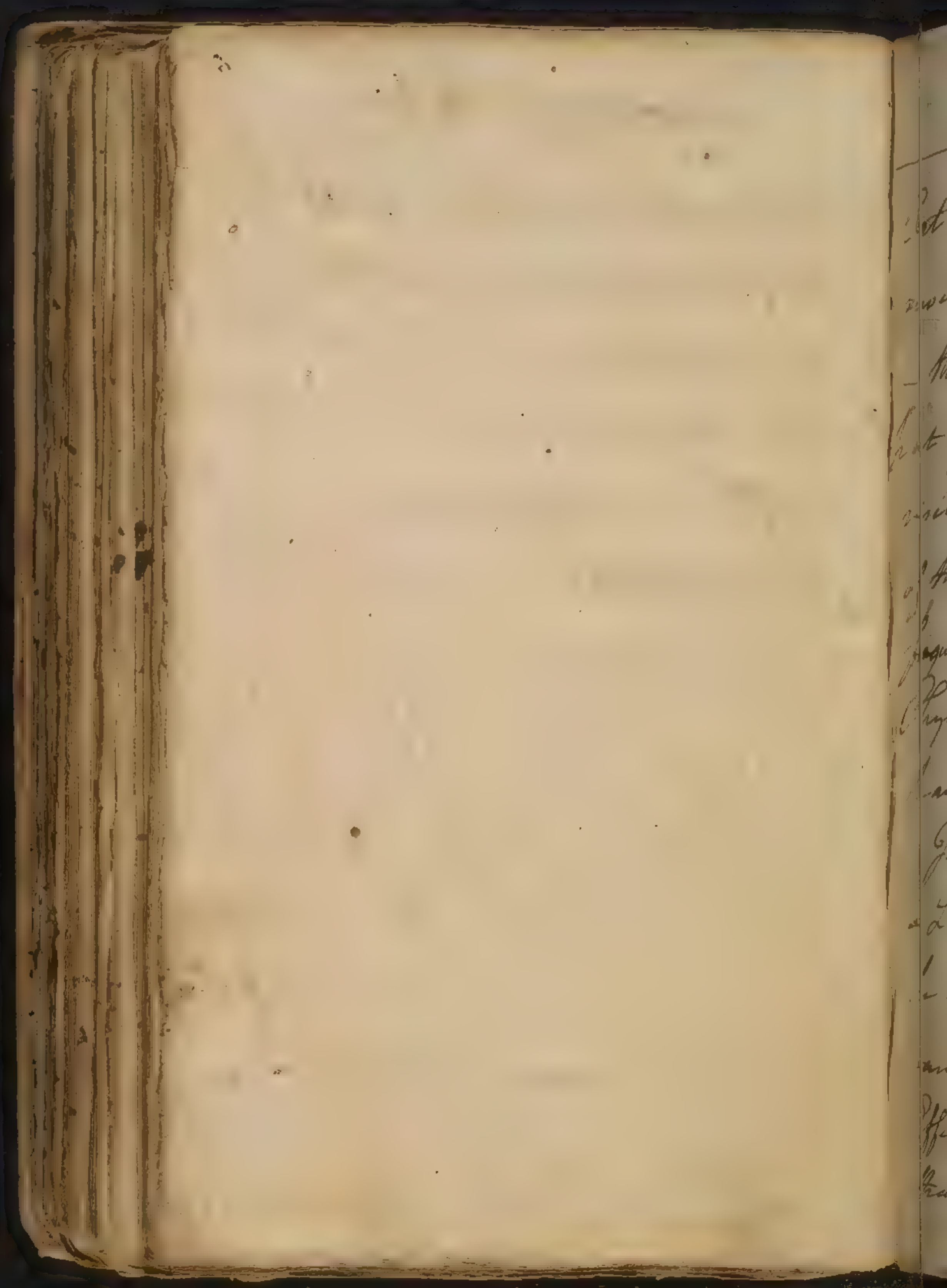
Vegetables cannot coagulate the blood except by absorbing the watery parts from it, this they cannot do as they are dissolved & their nature changed before they arrive at the blood.

But w<sup>h</sup> shall we say to viscid



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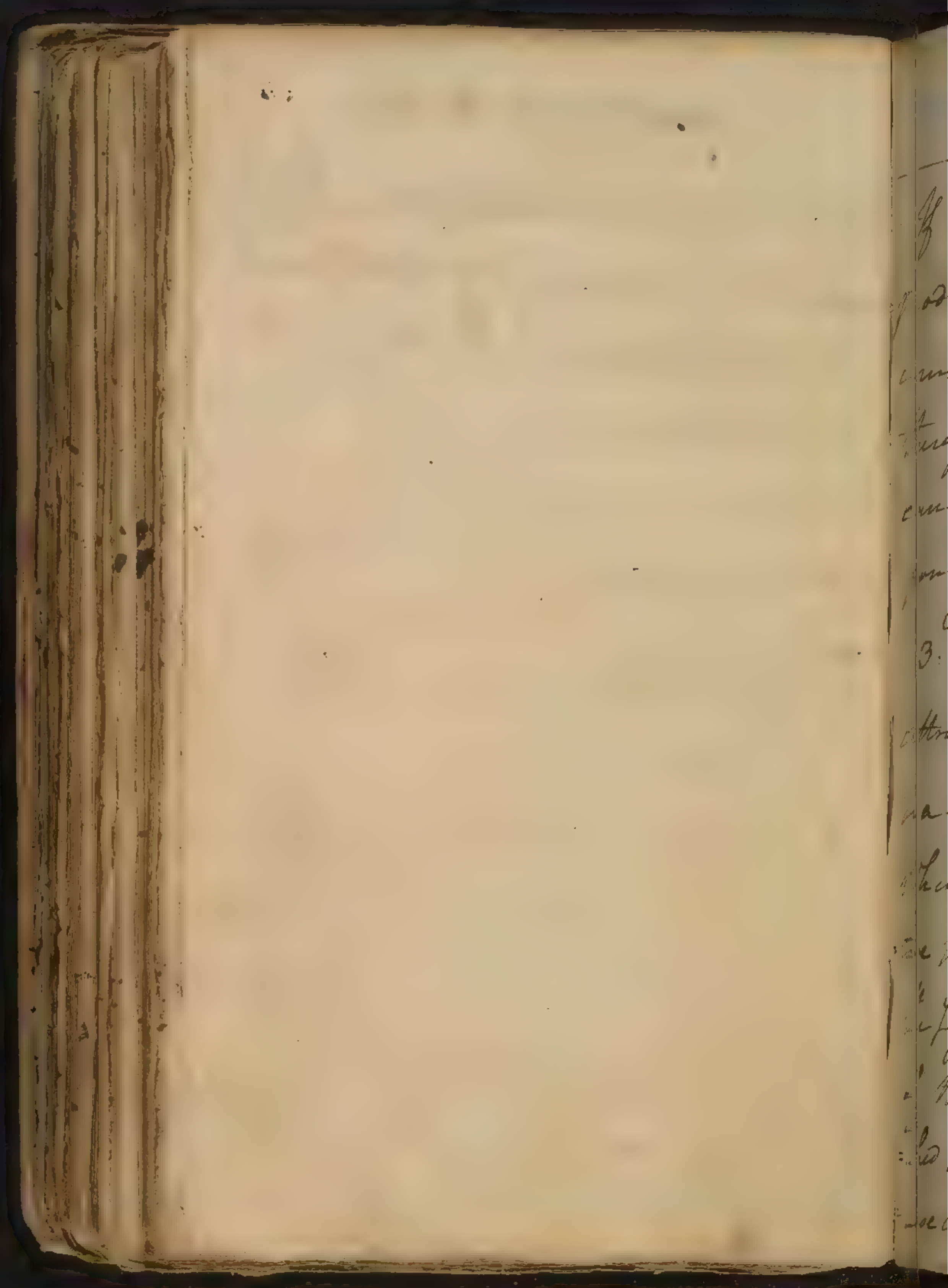
glutinous Aliments? Could these enter into the Blood unchanged, they might produce a Lenton there, but we before proved that all Aliment undergoes a Fermentation in the stomach: <sup>which</sup> loosens & destroys their Texture in such a manner as entirely to prevent any morbid Effects from them. After their undergoing this fermentation they are again diffused in such a manner as to have their viscidities destroyed if any should remain after the Fermentation is over. But further, we find many Examples as among our Peasants who live on unfermented





Eat Me al, & yet these Men's Blood  
never discovers any Marks of viscosity  
— the Trinaura make the greatest  
part of the Diet of Mankind. now if  
viscid humors were the consequence  
of them, we should have them more  
frequent & universal than even those  
Physicians who maintain <sup>their</sup> ~~its~~ Presence  
have affirmed.

I conclude then that the Existence of  
a Lector, or putrid natural spiritus may  
be a possible case, but we never  
can infer it from its causes or  
Effects, nor do I know any Symptoms  
that will ever indicate its Presence.

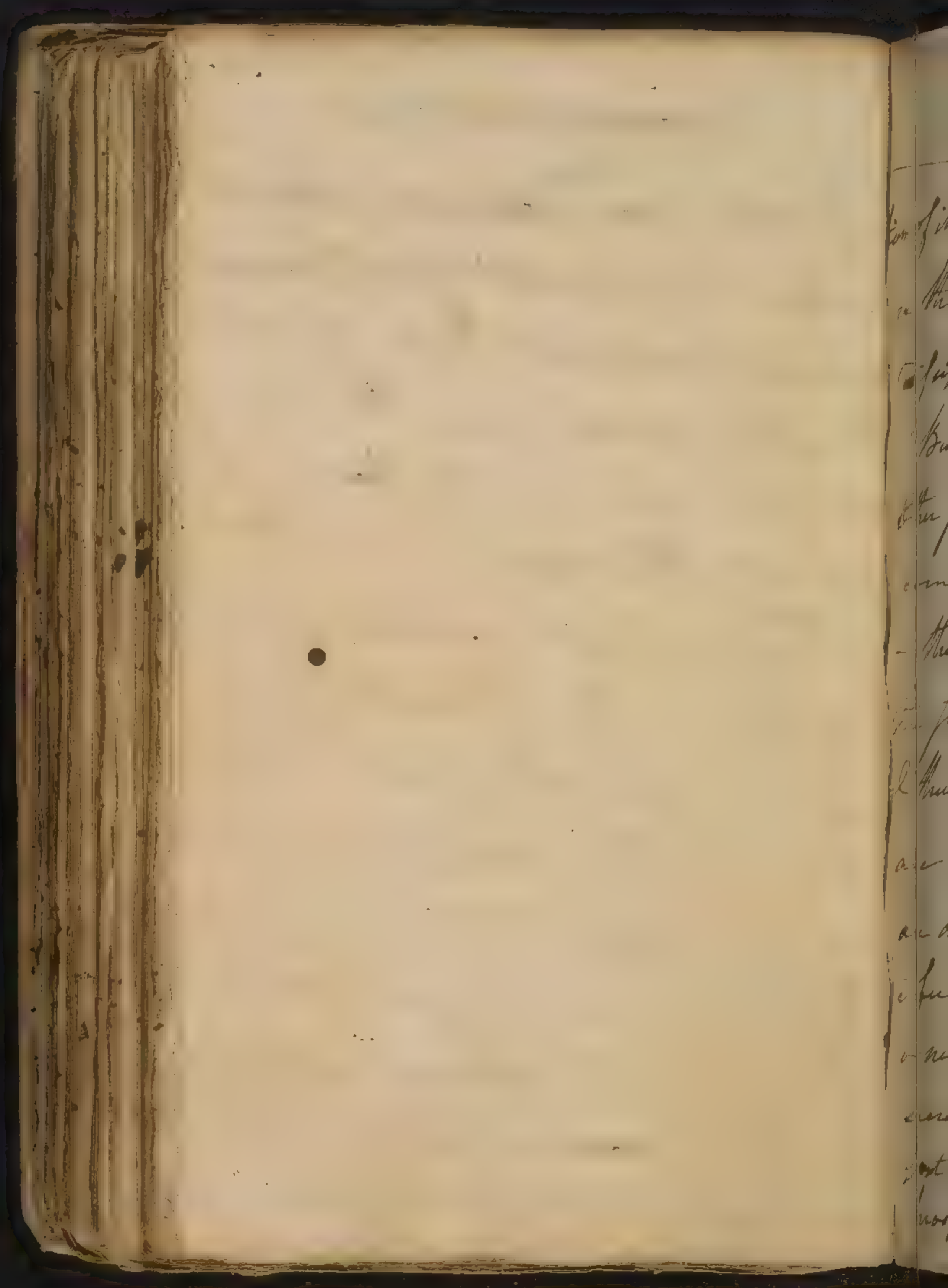


## Diseases of the Blood

If it ever <sup>take</sup> place it ought to produce more dreadful Effects than are commonly attributed to it. I would therefore advise you to be very cautious in admitting this Doctrine for you will often meet w<sup>th</sup> it in Books.

3.<sup>d</sup> a Lentor of the Blood has been attributed to the Absorption of the watery parts of the Blood. But when does this take place? Nature has wisely taken care to keep the System in a proper Balance. if the Quantity of Serum is diminished all the ~~serous~~ secretions likewise are diminished. Hence an Accumula-

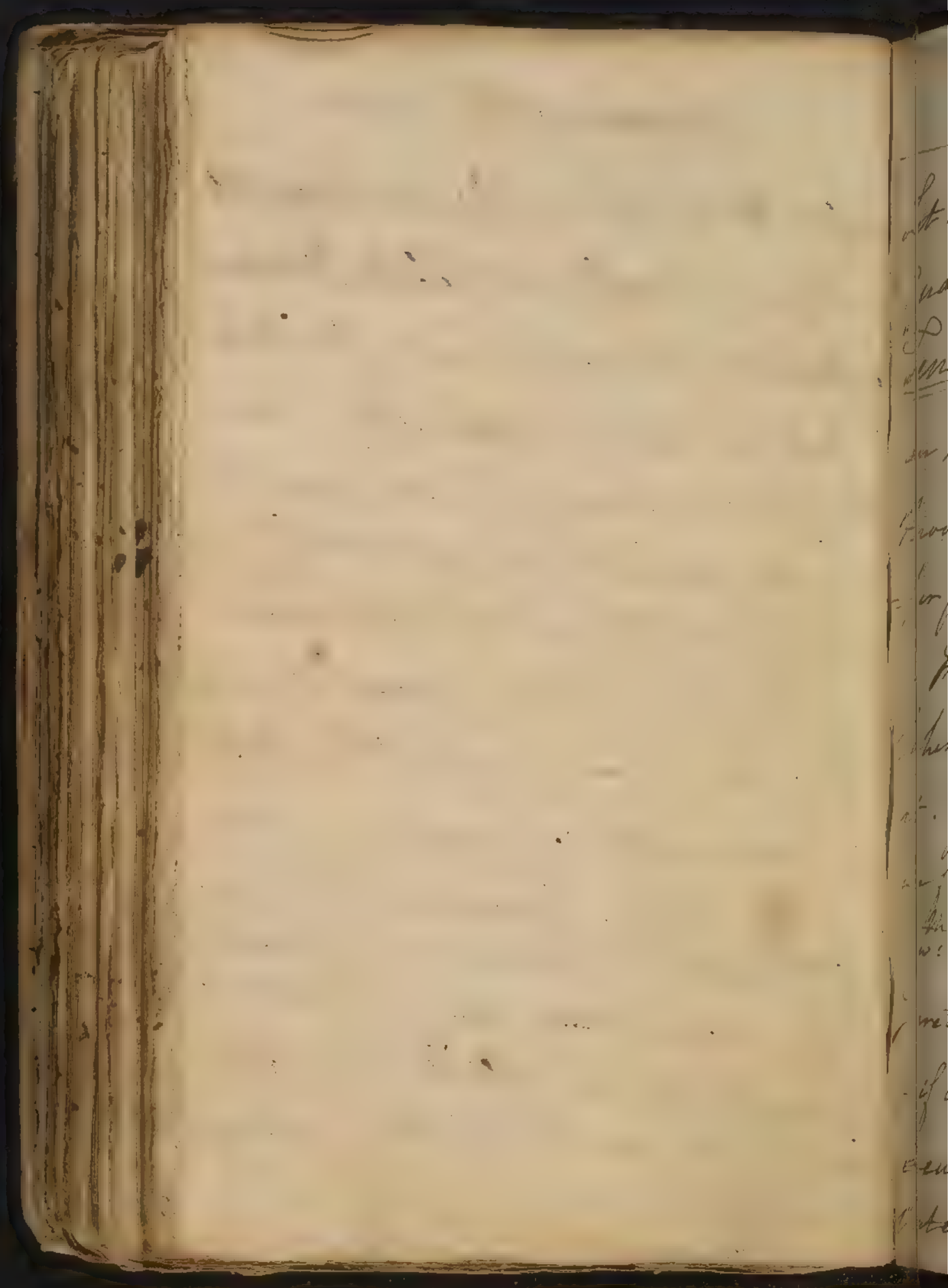




## Diseases of the Blood.

371

tion of it in the Body. Dr. Boerhaave tells  
us that Pudourics & febrile Disorders  
dissipate the watery parts of our Blood,  
But we have no proofs of this. Some  
Other Ferments must be stopped to  
compensate for the Loss of watery Sweet.  
— the Heat of the Fluids too increases  
the solubility of the Coagulable Lymph.  
It thus the serous parts of the Blood  
are regenerated in proportion as they  
are dissipated. From all this I w.  
infer that the Fluids are seldom  
or never diseased by having their density  
increased. It is a possible only. For my  
part I never saw it, nor do I know any  
proofs of it.





372

## Diseases of the Blood.

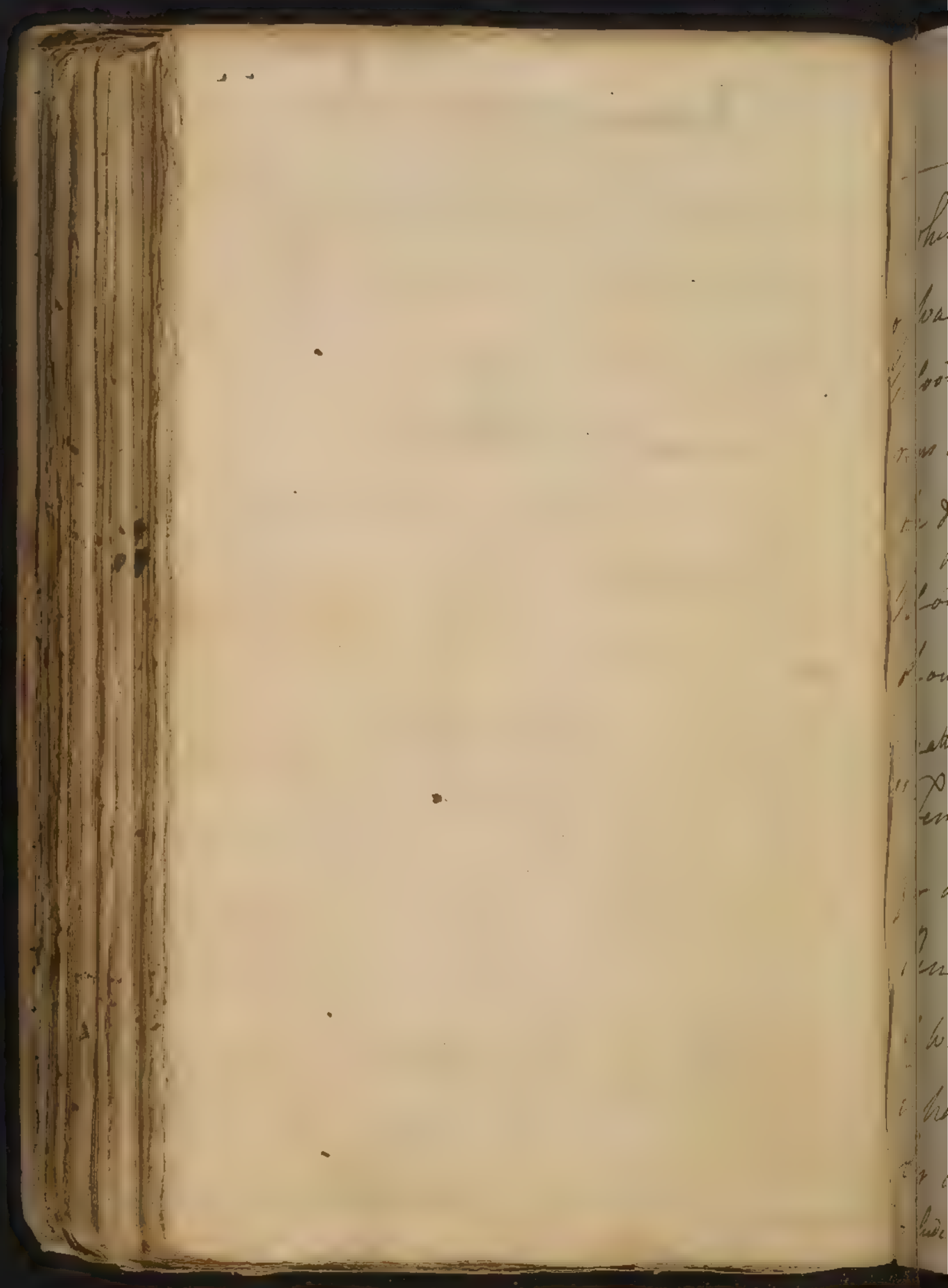
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Let us now consider the Opposite Qualities of our Fluids viz their Senuity. This may depend upon an Increased Quantity of water thrown in, or upon a want of proper Spirititude in them.

- It is very hard to tell when  $\frac{1}{2}$  first takes place. Nature wisely prevents it. if the Quantity of water is increased we find the secretions proportionally increased.

as it. if Perspiration is obstructed the Secretion by urine is always increased.

- if a <sup>morbid</sup> Senuity of our Fluids ever does occur, it must depend on the watery Secretions being obstructed, but

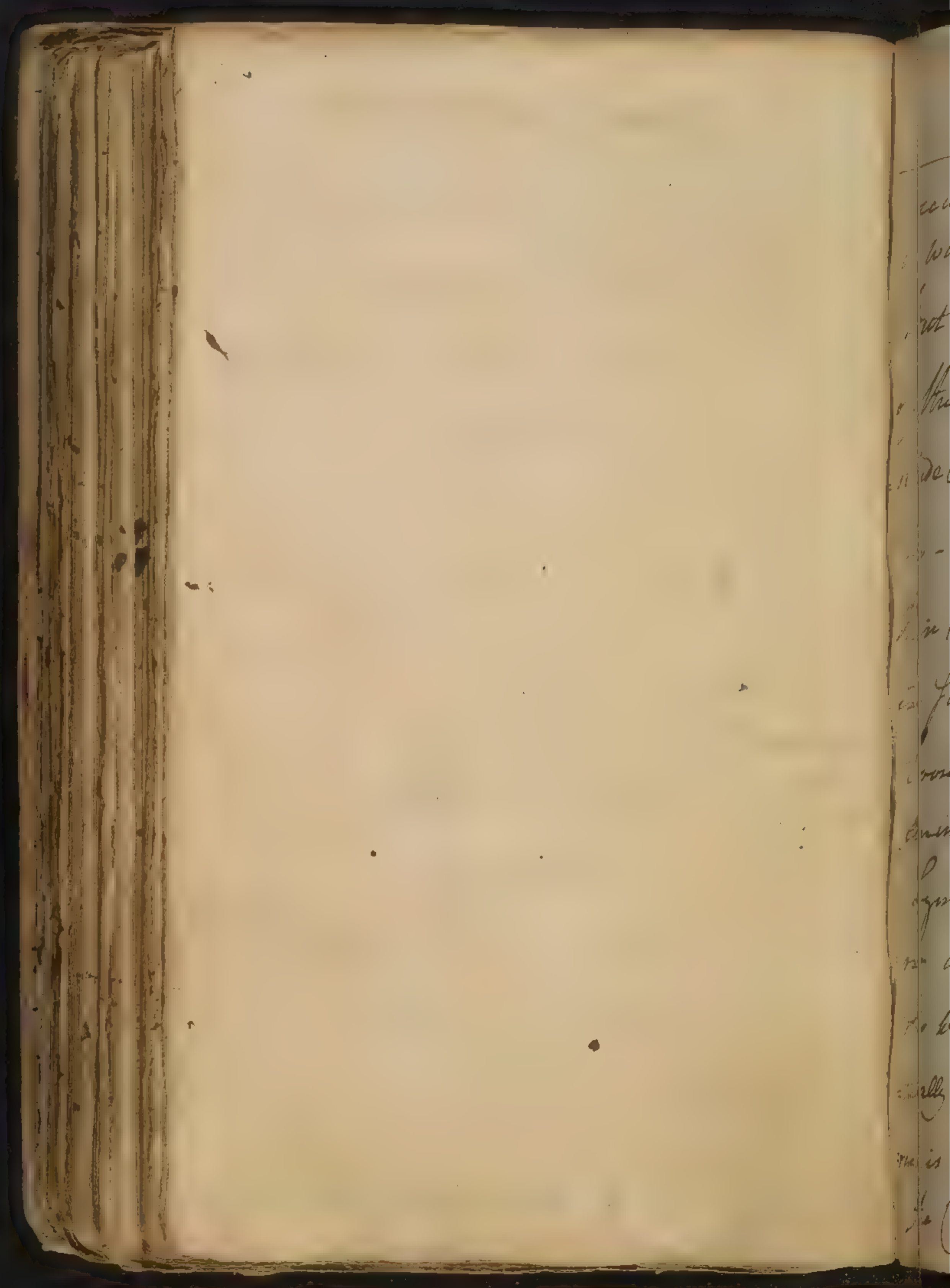




## Diseases of the Blood.

When this happens the Quantity of water is still not increased in our blood. the obstructed water always runs into some cavity & thus produces the different species of Dropsies. the blood of dropical Patients never shows a greater proportion of watery matter than is natural to it. the "Tenuitas Aquosa" may take place for a few minutes as in the Ichuria Renalis when a greater quantity of water is thrown into the blood than is natural to it, but this is alleviated by an increased Perspiration. Conclude then that a morbid Tenuity never



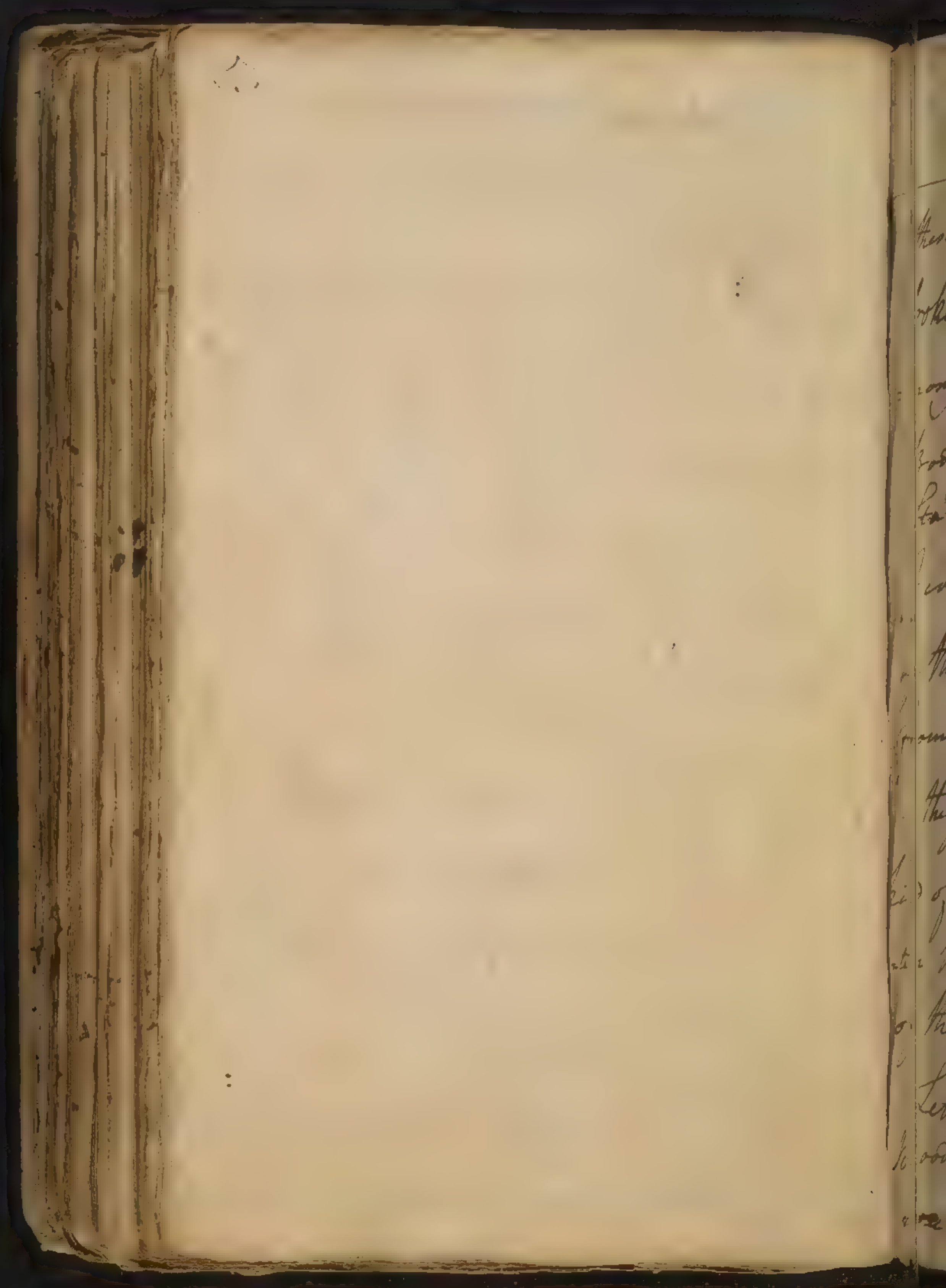


## Diseases of the Blood.

374

Occur in the Blood from an excess of water in it.

But do not the ordinarily thick parts of the Blood lose their natural viscosity & acquire the *Tenuitas Aquosa*? no - when they become preternaturally thin, their Qualities are altered, as in Scorbutic Patients, and they thus lose those properties <sup>ch</sup> w: constitute them Animal Fluids. in those Cases the Coagulable Lymph alone is altered in such a manner as to unite more readily <sup>th</sup> w: water. in this way only the Blood becomes preternaturally thin, as this Union <sup>th</sup> w: water or Lymph is always the natural Tendency of the Coagulable Lymph. the Blood in





## Diseases of the Blood.

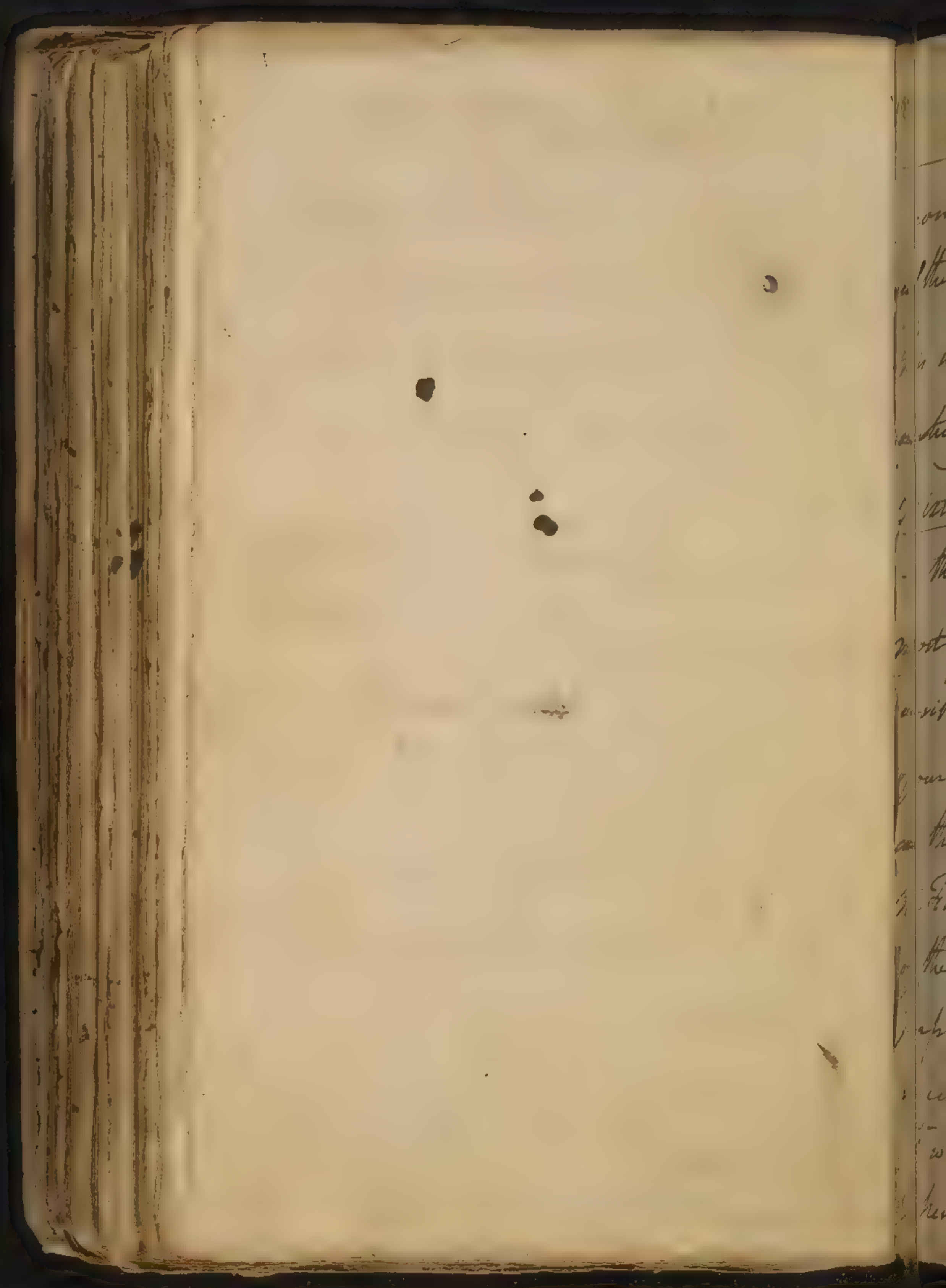
these Cases viz: in Scorbutic Patients is broke down. This we prove from its being many & from its escaping thro' parts of the Body w: refuse its passage in a healthy State.

I conclude then that a Morbid Tenuity of the Blood may occur in some Cases from the Causes we ~~have~~ have mentioned.

The final Cause of it may be because of this kind of Tenuity is less dangerous to the System than a Morbid Spissitude or Lentor of the Blood.

enquire

Let us now enquire into the Changes w: the Blood undergoes in its Qualities. If we were to be wished here we could



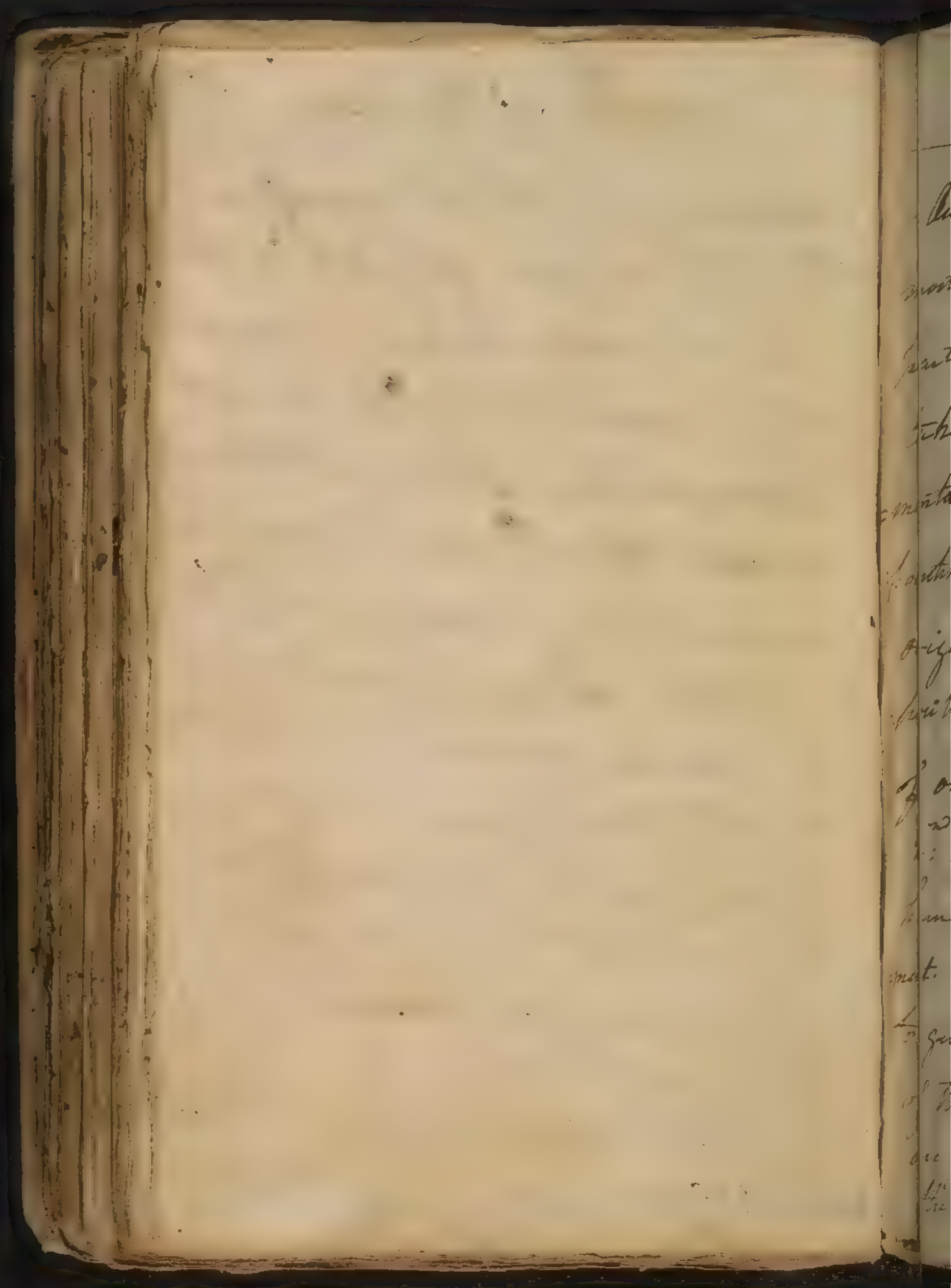


condescend upon the Changes of each of the Component parts of the Blood, but this would be a difficult Inquiry, as we are entirely ignorant of the true nature of the Mixture of the several parts of the Blood.

- the Coagulable Lymph has been accused most of deviating from its ordinary bland insipid state. <sup>the</sup> Sapid or saline state of our Fluids has always been considered as the Only Morbid Cases of them, & hence the Foundation of the much talked off Curimony of the Blood. As this is a Question of Importance we shall spend some time in enquiring into it. -

i we shall Observe the pre-nature has taken to Abviate Curimony in our Fluids.





## Diseases of the Blood 377

- Our Aliment we find consists of the most bland insipid substances for the most part. Some things I grant that we take, are acrid as the salts - the Condiments & some other things <sup>ch</sup> are of the appointment of nature herself, & were designed originally for our nourishment. The proportion then concerning the bland nature of our Aliment is by far too universal.

2<sup>nd</sup> Pericrany often attempts to enter the humors tho' not always in the way of Aliment. Nature indeed has taken great pains to guard ag<sup>st</sup> it in the extreme sensibility of the Tongue - Throat & stomach w<sup>ch</sup> are generally excited to expel or avoid the noxious matter w<sup>ch</sup> enters into them.

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## Diseases of the Blood 388

Should they escape the Stomach they stimulate the Guts in such a manner as if they are soon discharged by a Purgative.

- I somewhat doubt whether the Lactals are exposed of such a Degree of Incubility <sup>as</sup> some have supposed; I believe many things enter into them: <sup>as</sup> Physio-Logists are not willing to admit. upon y

whole then notwithstanding the Precautions of Nature I imagine Perimony sometimes escapes the Tongue Fauces & Stomach & enters into the Blood thro' y<sup>e</sup> Lactals.

- But Nature uses another power to avoid Perimony entering the Blood viz: the Fermentation & Other Changes

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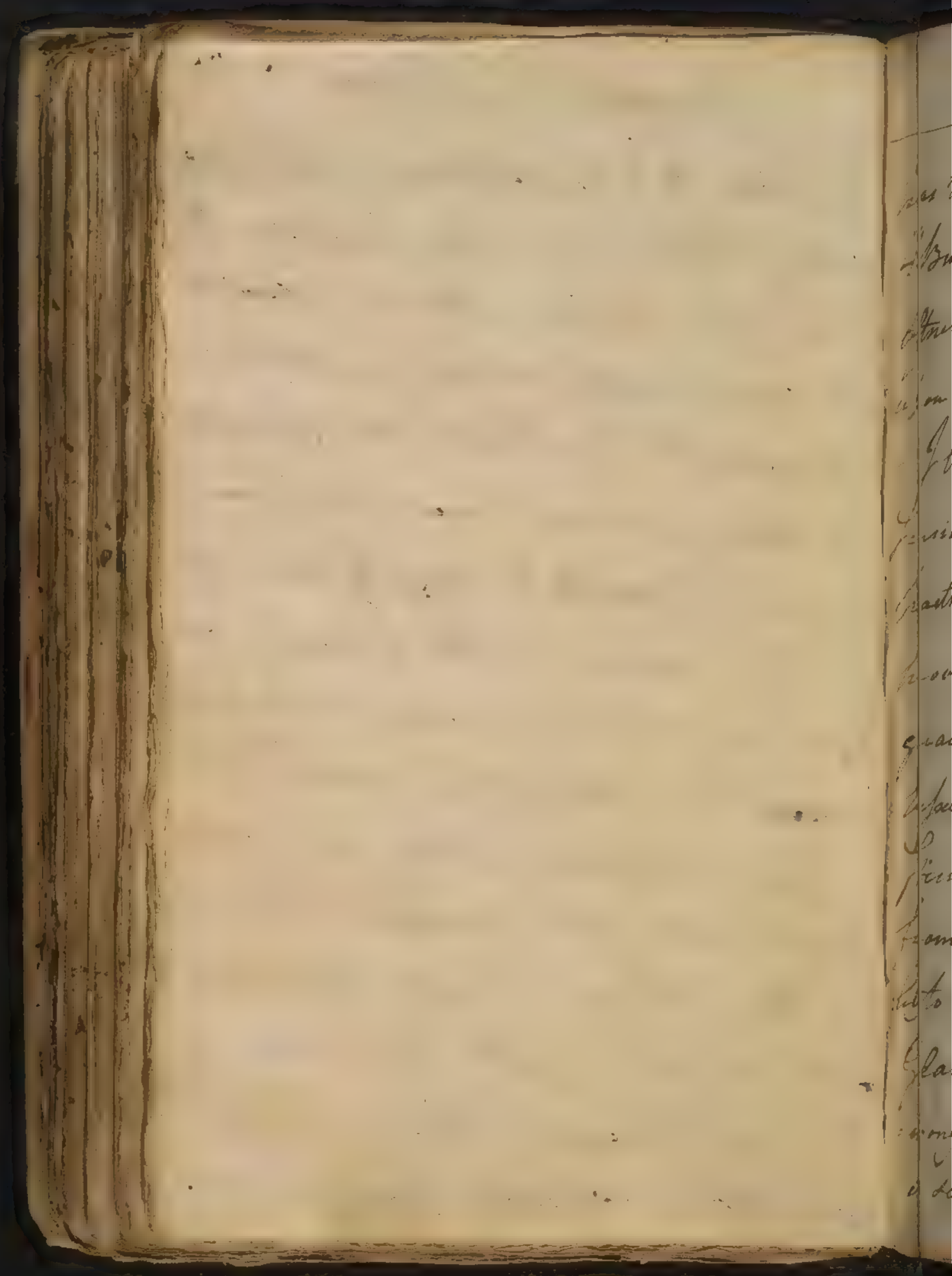
they undergo in the Primæviæ, even  
 Diffusion itself is capable of clearing  
 the Circumference of most of Substances,  
 especially when we add to this the several  
 matters that must mix with acid Sub-  
 stances <sup>th</sup> serve to diminish & destroy  
 this Circumference. But supposing Circu-  
 mference has entered into the Blood, I  
 believe there are powers in the System  
<sup>th</sup> tend to destroy it viz: the Oil in  
 the Cellular Membrane <sup>th</sup> is poured out  
 so plentifully from the Blood. hence we  
 find frequent Instances of its being very  
 suddenly Absorbed as it were on purpose  
 to cover Circumference received in the Blood.  
 3<sup>rd</sup> But supposing <sup>Circumference</sup> it has entered the



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## Diseases of the Blood 300

The Blood, & is not obstructed by the Bil,  
still I affirm it is often innocent. The  
Serum of our Blood acts as a Solvent to  
all acid matters, & thus prevents their  
mixing with the other parts of  $\frac{2}{4}$  Blood  
- As soon as they mix w<sup>th</sup> the Serum  
they are immediately discharged by some of  
the Excretories. all the Actions they do  
create are of such a nature as to excite  
an ~~ex~~cretion of them from  $\frac{2}{4}$  Body.  
- I do not suppose they act by exci-  
ting the Action of the Heart & Arteries.  
on the contrary I imagine they act only  
on the excretory vessels themselves when  
they are discharged. From all this  
you see how much pains nature





has taken to avoid leucimony in  $\frac{1}{4}$  Blood.  
 4<sup>th</sup> But further granting its Presence  
 oftner than ~~is~~<sup>is</sup> just, it ~~is~~<sup>is</sup> seldom acts  
 upon the more delicate parts of the Body.

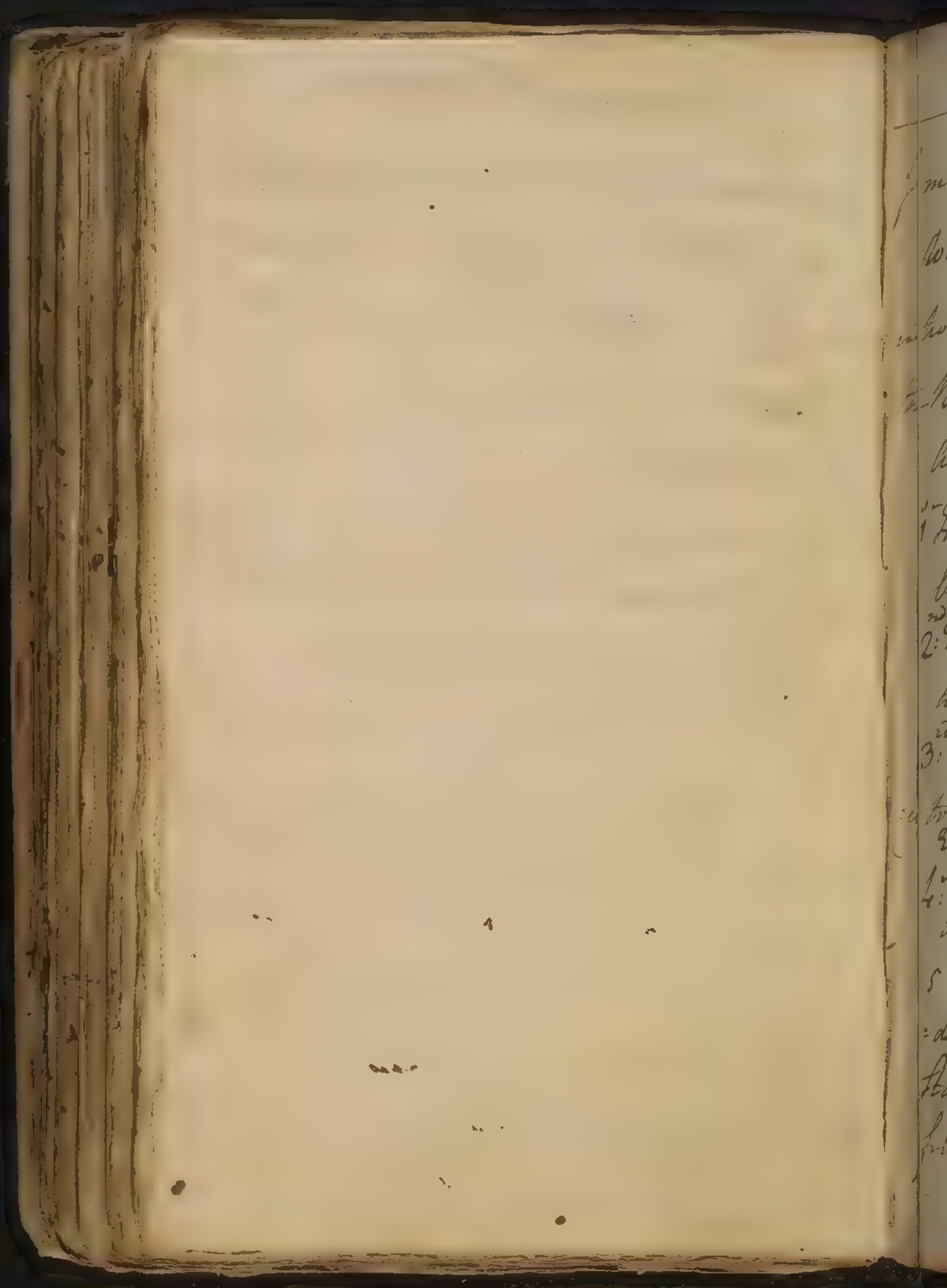
I believe the Articular System has no  
 Sensibility to its Stimulus. even those  
 parts w<sup>ch</sup> are sensible to its Stimulus are  
 provided by nature w<sup>th</sup> a Mucus w<sup>ch</sup>  
 guards them ag<sup>st</sup> it. perhaps the Blood  
 vessels may be defended likewise from the  
 Stimulus of leucimony by the Oil w<sup>ch</sup> exudes  
 from them as well as by their Invari-  
 ability to leucimony. The Secretories of several  
 Glands are provided w<sup>th</sup> Sensibility to leu-  
 imony & supply for the System that it  
 is so. for by this means it is discharged.

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But allowing leucimony to subsist  
in the system, Pathologists have reasoned  
wrongly in inferring <sup>Diseases</sup> either from its Cause  
or Effects. Dr. Gambius deduced Phans  
Hamorrhoids from it, but in 500 Cases  
I am sure they depend upon very diffi-  
rent Causes. even the Operation of our  
own Urine is sufficient to bring on Con-  
volutions <sup>the</sup> without calling in leucimony to  
account for them. leucimony I own  
does take place notwithstanding the Precautions  
Nature has taken to obviate it, & to such  
a degree as sometimes to induce Diseases,  
but these are much fewer than has been  
supposed. they are moreover of a very subtle  
nature w<sup>ch</sup> act as Ferment upon the Blood.





I mean Contagious.

We shall then consider Erythema as introduced from without & as generating in the Body itself.

Erythema then may be derived ~~from~~.

1<sup>st</sup> From the Aliment not directly acid but becoming so by the powers of the Body.

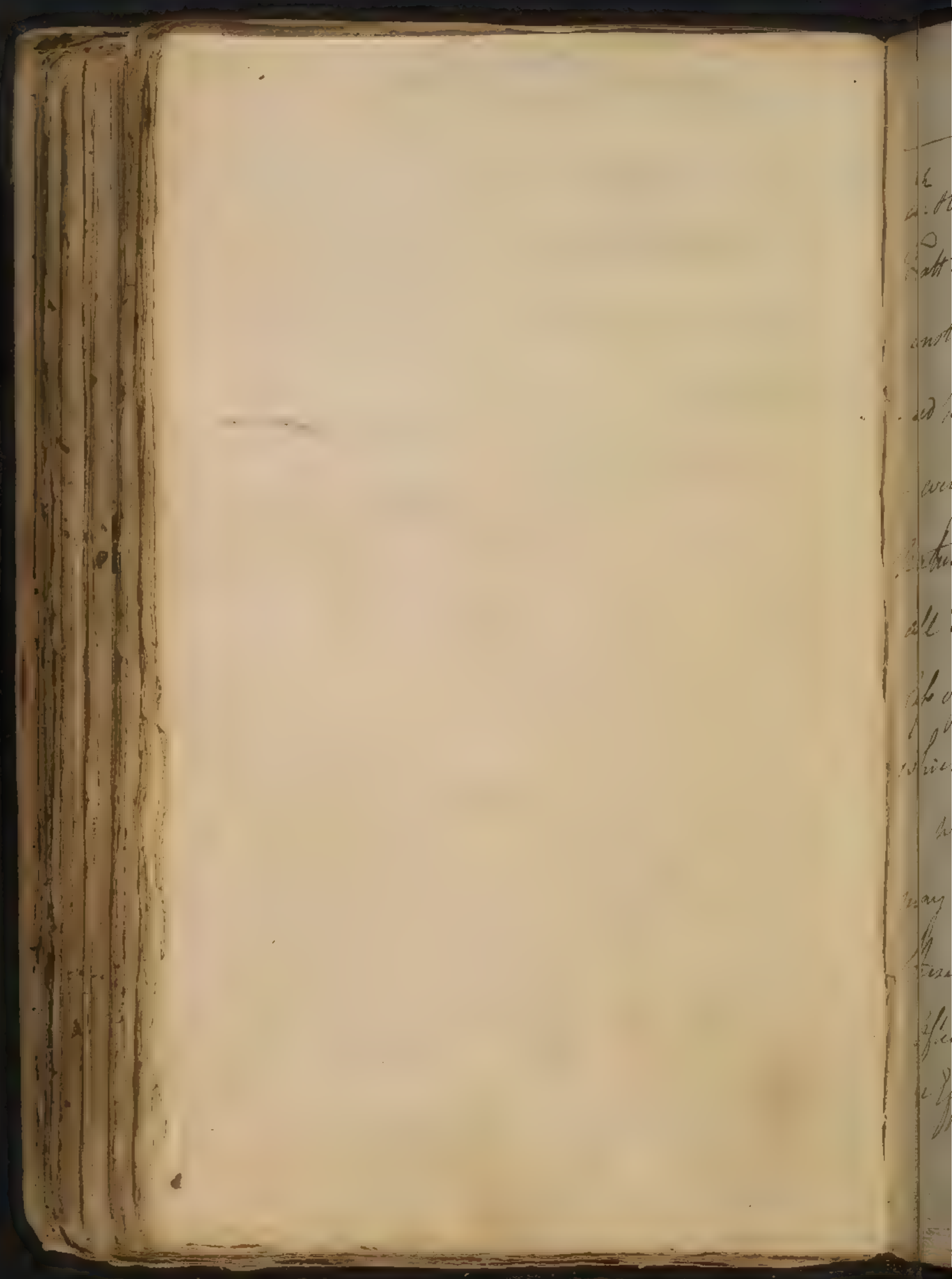
2<sup>nd</sup> From a want of Aliment w<sup>ch</sup> Obviates Erythema in our System

3<sup>rd</sup> From those powers w<sup>ch</sup> give a Tendency

to Erythema being encreased such as an Excess of Heat, or Circulation of the Blood.

4<sup>th</sup> From Changes induced in the Fluids by Mors in Fermentation. of this we can say but little.

5<sup>th</sup> From the Changes w<sup>ch</sup> our Fluids undergo from the Circumstances of their Stagnation. This is perhaps the most fruitful Source of Erythema in our System - we know of no Fluids in the Body



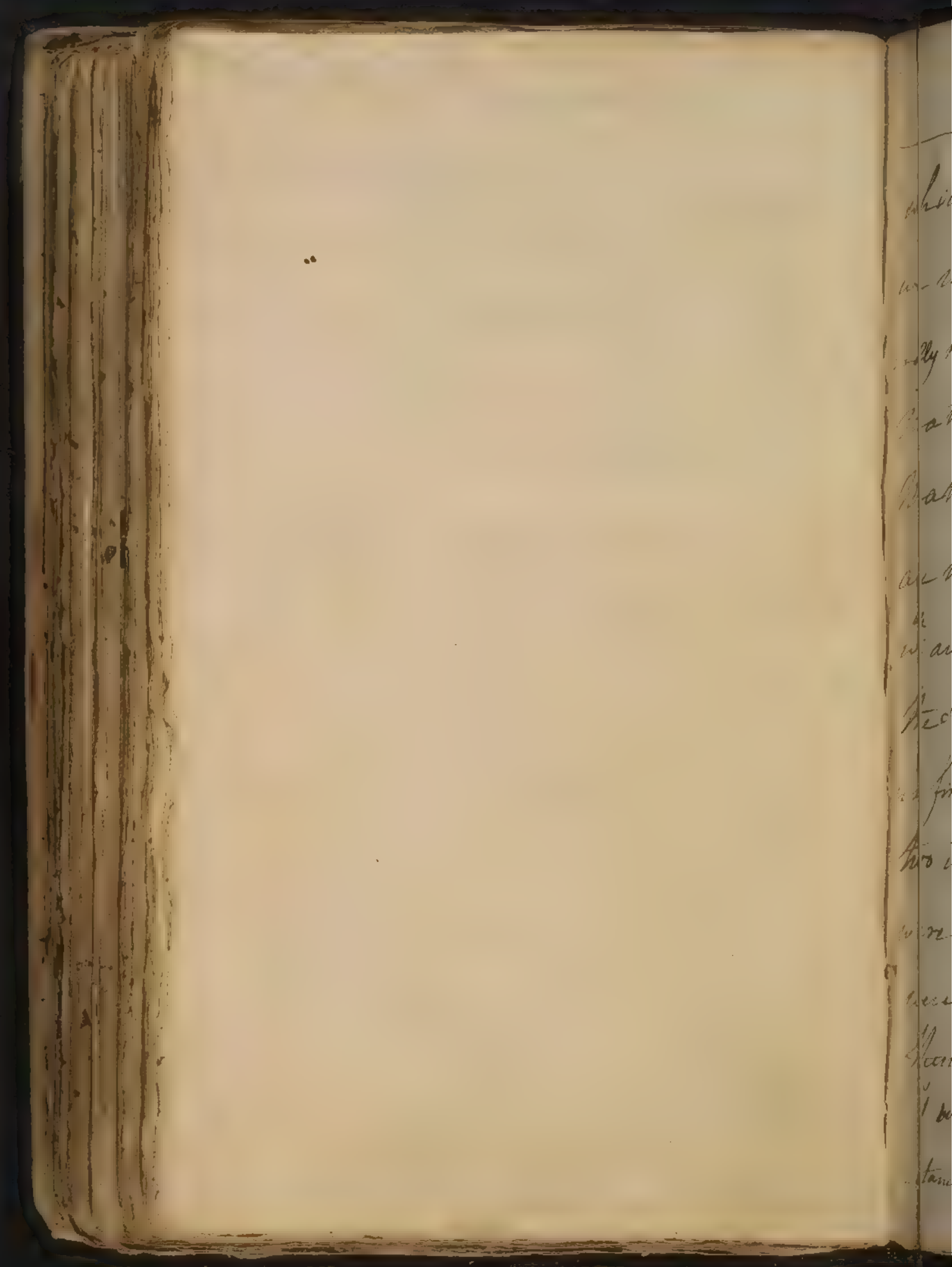


Diseases of the Blood. 394

<sup>ch</sup> w. stagnate in a healthy state. even the  
Heat itself is absorbed & poured Out Again  
constantly. all Fluids then previously effu-  
sed have a Tendency to bring on Hemimony.  
- every portion of our Fluids are of a fermentable  
nature provided they enjoy Heat & Air. Now  
all Fluids effused in our Body have more or  
less of these, & therefore tend to those Changes  
which Fermentation naturally induces.

we have no Doubt but w<sup>2</sup> Hemimony  
may be introduced into the System from all  
these Causes. But I repeat it Again it has  
often been accused unjustly from its Causes  
& Effects.

But w<sup>th</sup> kind of Hemimony are they



## Diseases of the Blood 395

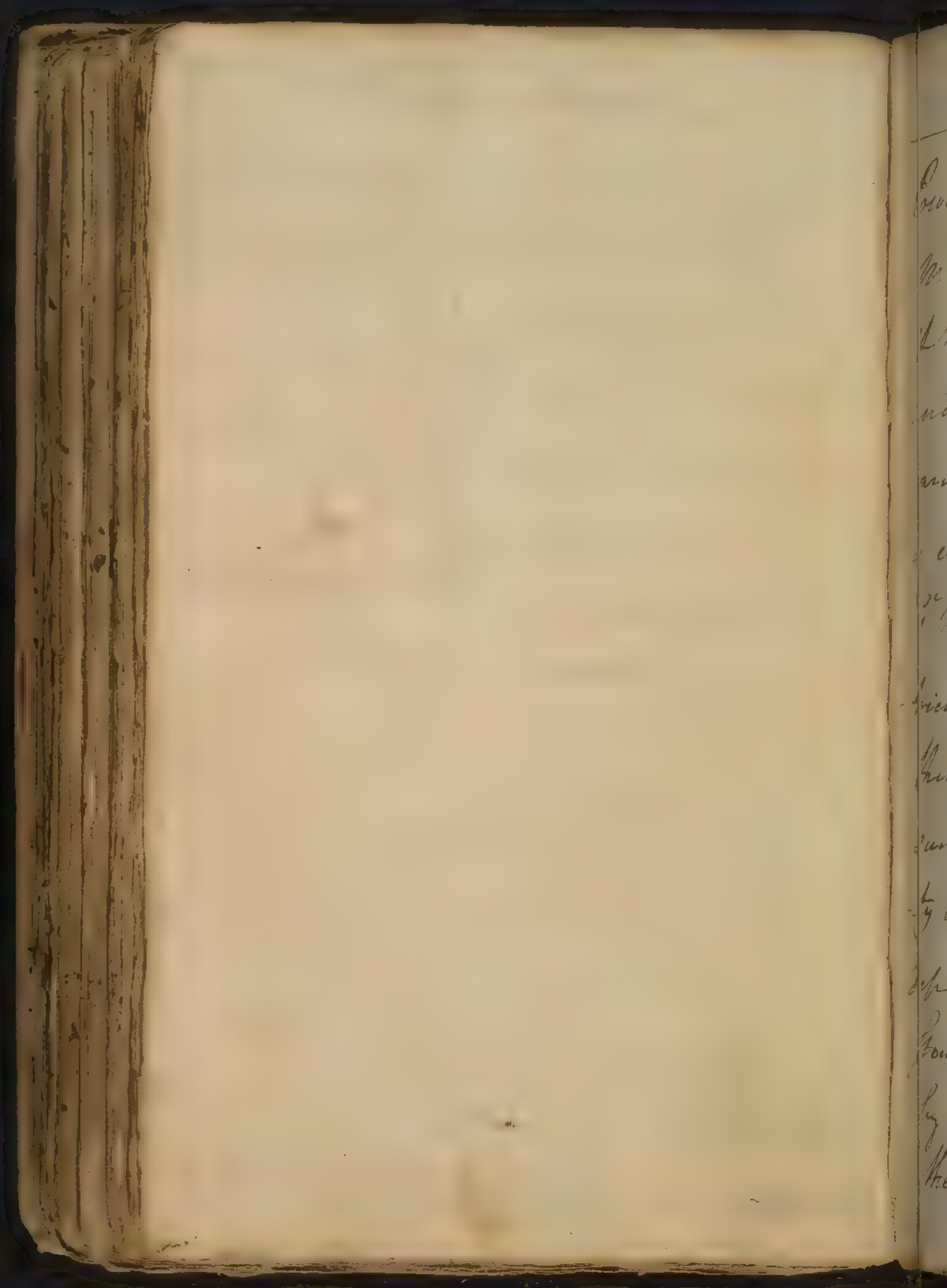
which prevail in the Blood? Here again  
we meet w<sup>th</sup> great Difficulties. We gene-  
rally refer every kind of Humour to saline  
matter. of w<sup>h</sup> nature there are 2 saline  
Matters of the Blood? we know there  
are many different kinds of Salts in Chemis-  
try w<sup>h</sup> are of a simple & Compound nature.  
The simple are acids & alkalis. Let  
us first enquire after the Presence of these  
two in the Blood. Formerly all Diseases  
were attributed to one of these, & Remedies  
were ordered according to Obviate & Obviate  
them. Let us attend first to the acids.

I we Daily take in acids & acerbic sub-  
stances in our Aliment. even those substances



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<sup>or</sup> we are not naturally asscent become  
so in the stomach. notwithstanding this too.  
-lution of an Acid from all our Aliment it is  
always removed in the process of Chylifi-  
cation. We have no proofs of the Presence  
of an Acid in any part of the body except  
in the primo via: Let the Degree of the  
Acid in the Stomach or its Quantity be ever  
so great. it is always more or less cover-  
ed before it arrives at the Blood even suppos-  
ing the Assimilating powers to be ever so  
weak. It would consume too much time to  
enquire into the nature of those substances  
<sup>or</sup> we are supposed to give the most Acid.  
Aliment, or to treat of those Causes <sup>or</sup>  
weaken the force of the Assimilating





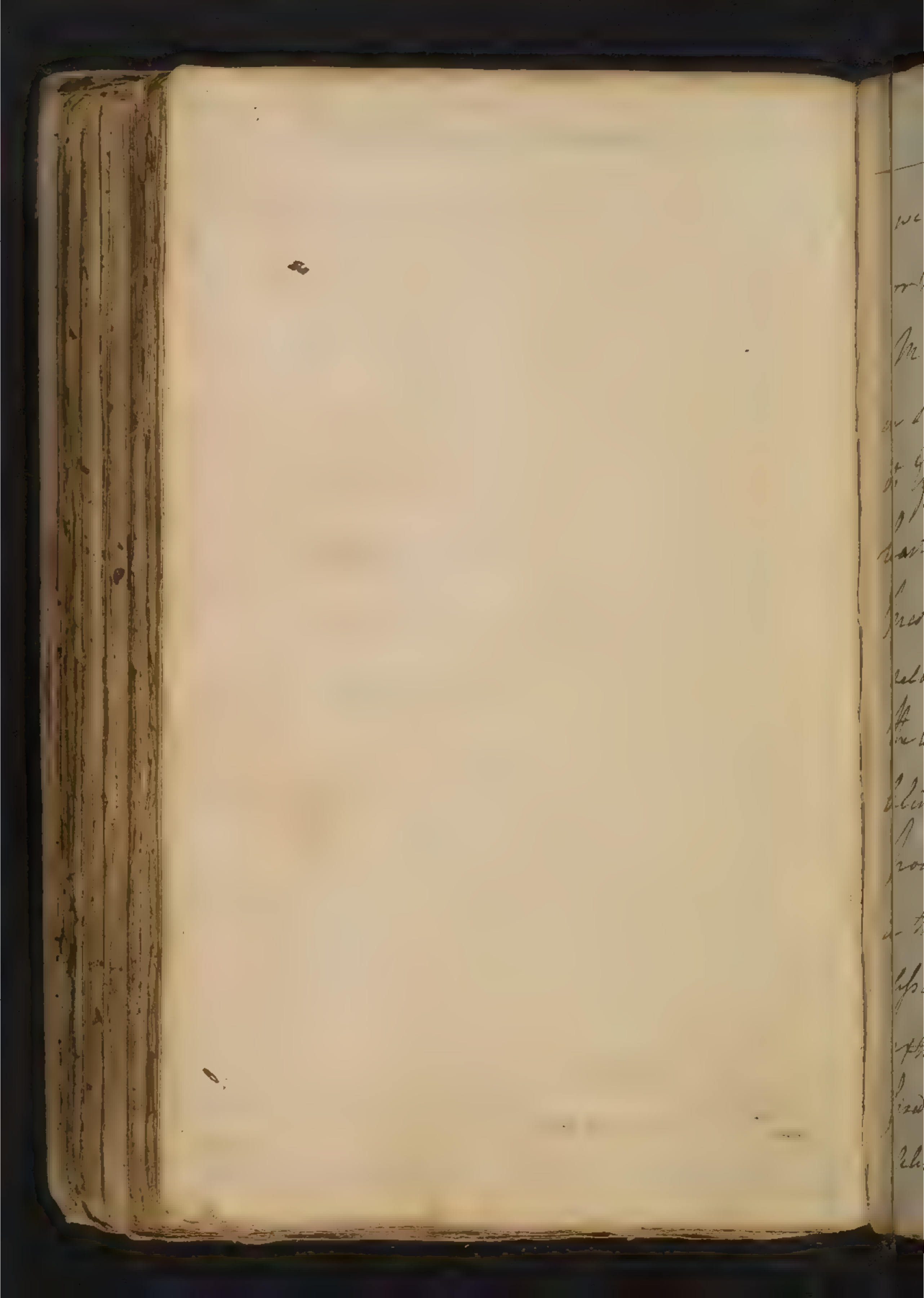
Poisons. But w<sup>h</sup> shall we say to the Mineral Acids? - They act as Poisons, & therefore do not come immediately under our notice here. w<sup>h</sup> Diseases arise from the Acid in the Primæ viæ B<sup>ch</sup> is evolved from our Aliment? They are 1<sup>st</sup> the Heart Burn. 2<sup>nd</sup> the Morbus Ventriculi. 3<sup>rd</sup> Pica & sometimes Bulimia. There are other Diseases arising from it, such as the Feelings w<sup>h</sup> are peculiar to Gouty Persons. all these Affections do certainly depend upon the Presence of an Acid in the Stomach & are greatly influenced in their violence by the Degree & Quantity of this Acid. But there other more considerable Affections

121<sup>a</sup> "It may be <sup>a</sup> subject of Inquiry whether  
these Disorders of the Bowels depend  
upon the Acid acting simply upon <sup>e</sup> Bowels,  
or upon its <sup>not</sup> being sufficiently neutralized  
by the Bile, or partly upon fixed Air vol-  
-ved from the Aliment during <sup>e</sup> further  
progress of Fermentation of <sup>e</sup> Aliment  
in the Guts" —



we arise from the circumstances of Fer:  
 mentation in the prime via viz: from the  
 extrication of the phlogiston in w: action  
 the nerves of the stomach, & here indeed  
 as Atonia w: lay the foundation for  
 all those spasms & irregular motions w:  
 we find the stomach subject<sup>to</sup> even the  
 Cholera Morbus & many other Diseases  
 of the bowels are more or less induced by  
 this Cause. The Acid of the stomach altho'  
 it sh<sup>d</sup> escape unchanged thro' the Duodenum  
 from the action of the Bile, yet it produces  
 Diseases only in the Intestinal Canal such as  
 Dysenteria Gripes - wind &c. I admit then  
~~that~~ <sup>the</sup> Acidition in Diseases of the Intestinal  
 Canal But does it go further? I answer





we have no proofs of it in the lacteals  
or Mass of Blood? It may be present  
materially here i.e. involved & covered  
in such a manner as to show none of  
its Effects. But I deny our having the  
best Reason to suppose it is Formally  
present there. This finger is from enkind:  
seldom or never appearing in the intestines after  
the Effusion of Bile & pancreatic Juice to  
Aliment, to w<sup>ch</sup> we may add the diluting  
power of the Lymph w<sup>ch</sup> mixes w<sup>th</sup> Chyle  
in the Lacteals. & from the Nature of the  
Assimilating powers in the Blood. There are very  
extraordinary & surprising. hence we find  
fixed Alkali changed into volatile & all  
Aliment yields an Acid which we shall

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## Diseases of the Blood 400

say hereafter enters more or less into the composition of the Blood.

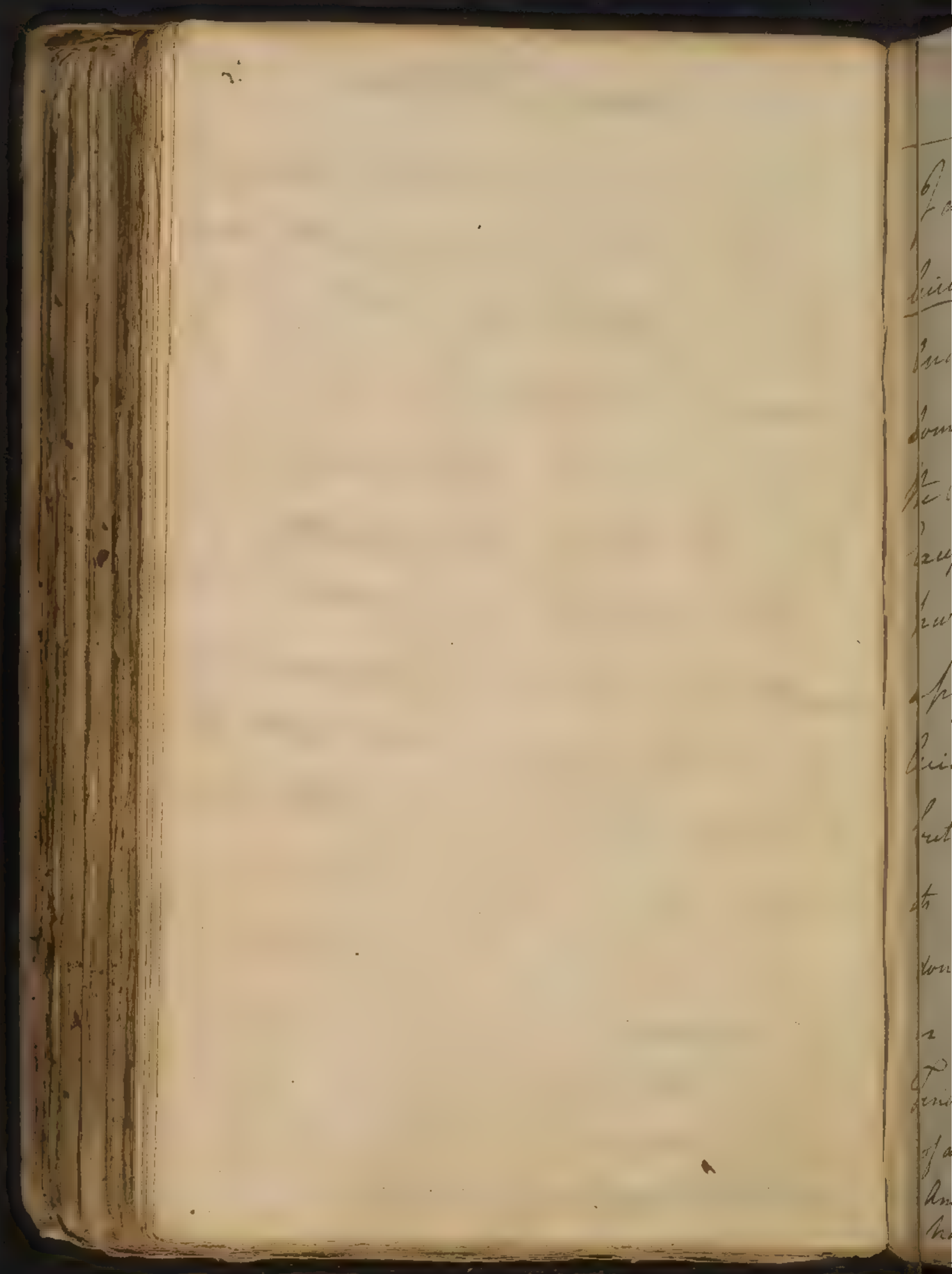
3 from all our Humors tending to Putrefaction <sup>ch</sup> w: effectually abridges the consequence of an Acid in the Blood. But w: shall we say to the Milk which yields an Acid as soon as it comes from <sup>the</sup> Breast? — This Acid is the consequence of Fermentation. Lactic acid exists formally in the Blood, nor do we know any thing <sup>of</sup> it can decompose it in the Body. Besides previous to its evolving its Acid it requires all those Circumstances <sup>ch</sup> w: are necessary to Fermentation, such as Heat &c. &c. Even supposing that it nearly existed in the Chyle formally, yet it is always

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so covered as never to show any of  
its Effects. but I cannot admit it ever  
being formally present in the Cycle.  
I conclude therefore that no such  
thing as an Acid Humor ever pre-  
vails in our Blood notwithstanding it  
has <sup>been</sup> maintained by men of such Consi-  
derable Characters as De Boerhaave & D.  
Gaubius. The Diseases attributed to  
an Acid in the Blood by both these  
Authors may be accounted for upon some  
simple Principles. I acknowledge however  
that Mineral Acid may sometimes be  
present in the Blood if taken by acid eat  
into the Body, for we know of no power  
in the System capable of changing it.





I acknowledge likewise that Vegetable  
Acid enters into the Composition of  
Animal Matters. Now this Acid may  
sometimes be in an Over-proportion to  
the other matters it unites with, from an  
excess in the Quantity of vegetable or  
putrescent Aliment. I allow it therefore  
a possible case that there may be a morbid  
Acidity in the System from this cause,  
but I deny our having any proofs of  
its being formally present in it. I even  
doubt whether particular Aliment such  
as Animal or vegetable have any  
Tendency to produce an Over-proportion  
of acid Acid, or any Decomposition of the  
Animal Solids. Notwithstanding so much  
has been wrote & said upon this subject.

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11. Let us first enquire after the Presence  
of fixed Alkali in the Blood. This has  
withstood all the Disputes concerning its  
Origin is a Product of Nature but  
Fire is always more or less <sup>necessary</sup> to  
extract it. ~~for its purpose~~  
- Now we know of no powers in the  
Body capable of evolving a fixed Alkali  
- from our Solids altho' it may be pre-  
sent there in a compound state. Within these  
30 years Alkaline Medicines have been  
taken in great Quantities as Lithon-  
-trethick & these have been supposed  
to produce an Alkaline Curimony  
in the Blood. Dr. Gusham is princi-  
pal Author who maintains this Doc-

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404

## Diseases of the Blood.

= true. I grant it is hard to refuse Facts  
but when they are solitary I think we  
may be sceptical w: <sup>th</sup> regard to them.

- if alkaline salts ever reach the bladder  
so as to dissolve stones then, we might in-  
fer their presence in the blood, but it is  
very doubtful whether these salts ever  
reach the urinary passages. So as to pro-  
duce any dissolving effects there. The same  
Relief w: alkaline salts give in Cases of  
stone may be obtained from medicines  
<sup>th</sup> we have no dissolving powers. Even sulpho-  
king may did dissolve the stone in y<sup>e</sup> bladder  
yet still I would rather suppose they were  
accumulated in the bladder, & did not enter

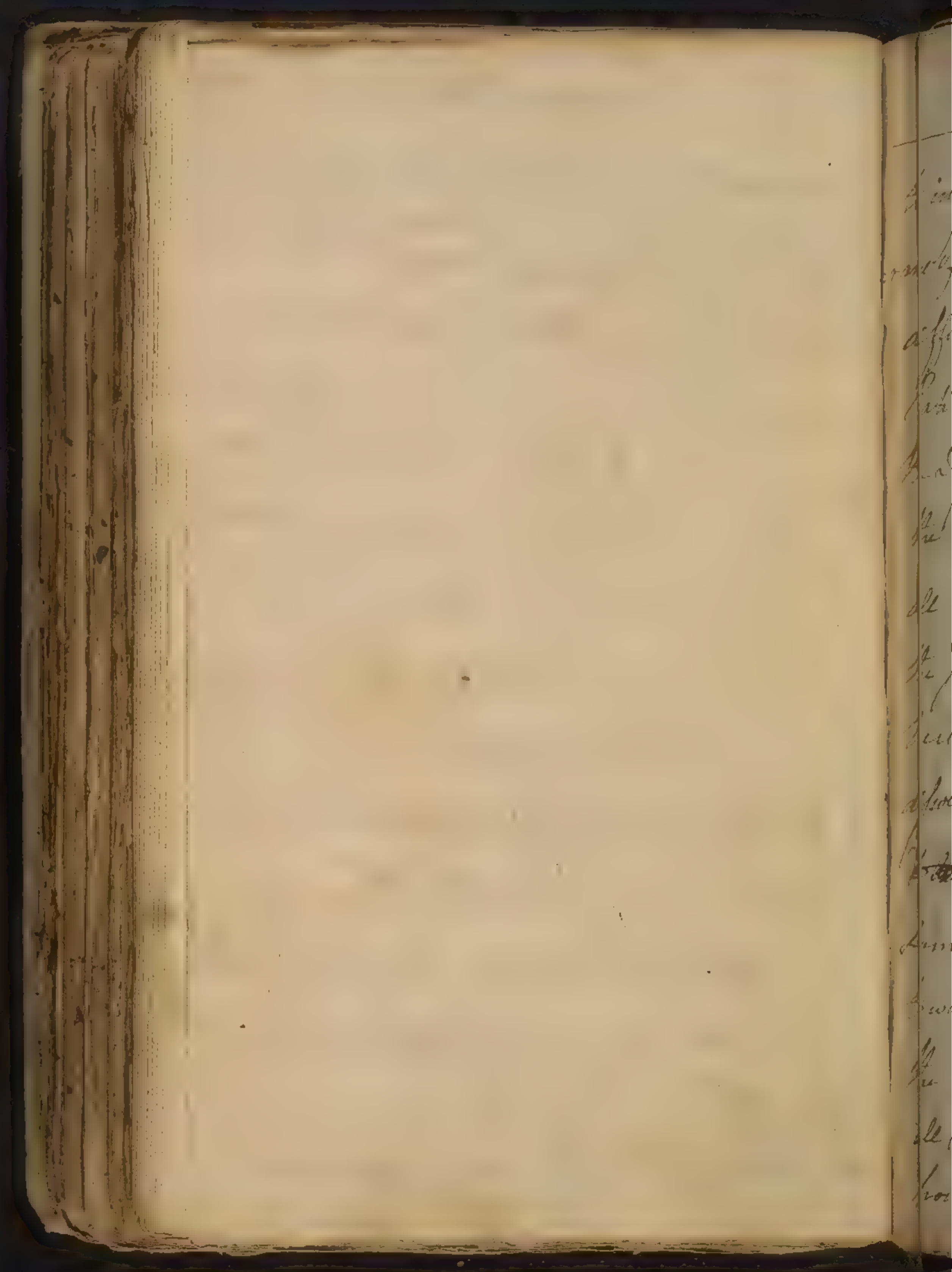


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into mixture w: the Blood. The Alk. salt taken  
in Lime water is very small, & are gene-  
rally washed off by the water taken w: them.

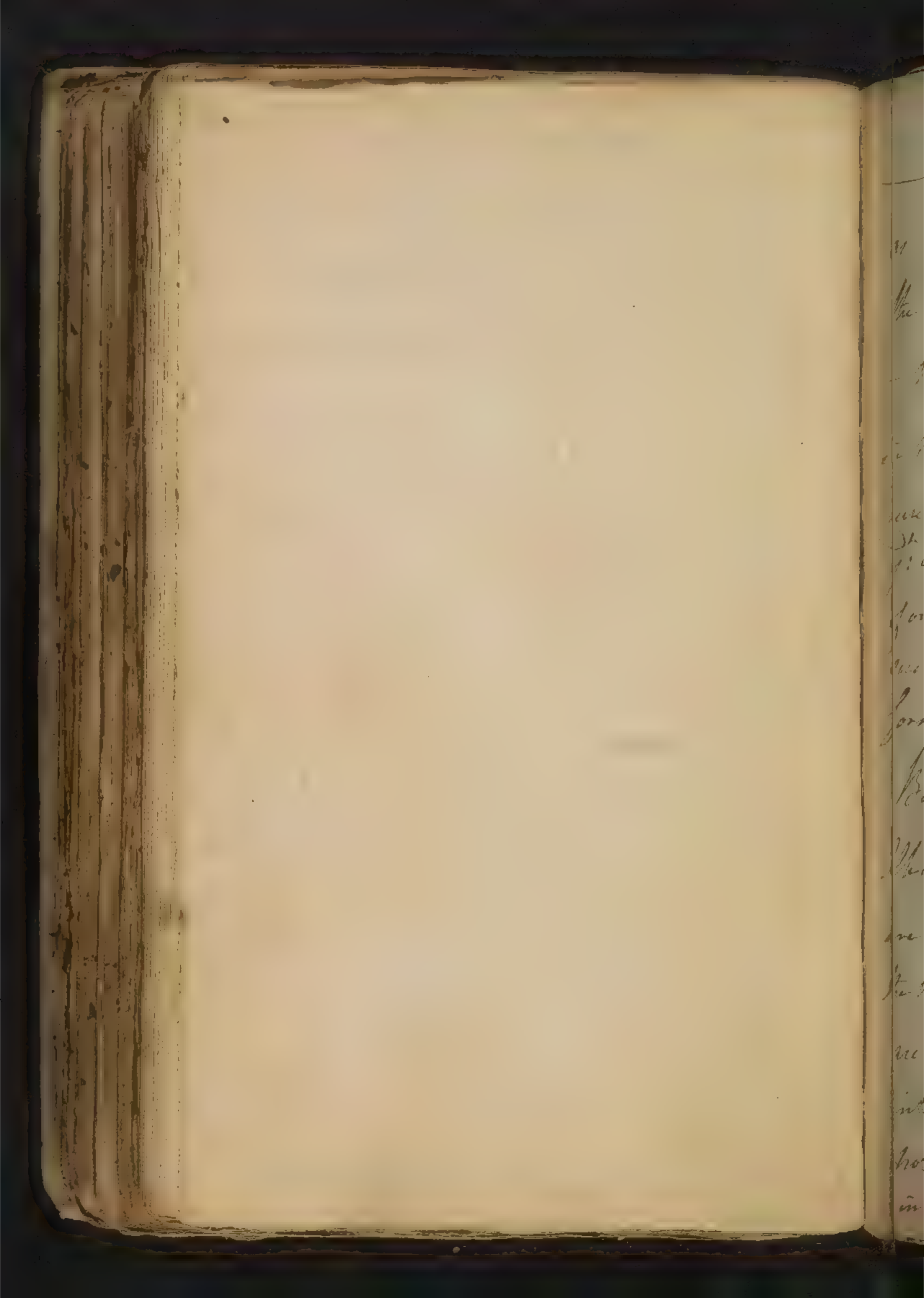
But further all Alkaline Substances in  
common w: Lids are more or less destr-  
oyed by their Diffusion in the Prime  
Vie. & by mixing w: the Acid of y<sup>e</sup> Stomach.  
Some tell us the Urine has yielded  
marks of a fixed Alkalia, but I deny  
that. I grant it contains a volatile Alka-  
li & this, it is highly probable has been  
mistaken for a fixed Alkali.

But from whence does the diseased state  
of the Blood arise & Rusham speaks so  
much of? — But here we must con-  
plain that Dr Rusham has neglected





to inform us of the precise Apppear-  
ance of the Blood, & in what manner it  
differs from the Blood of scorbutic  
Patients. Besides we may account for  
the Discoloration of the Blood <sup>is out</sup> by supposing  
the Alkaline salts acting upon them.  
all Alkaline salts are neutralized in  
the Stomach & we <sup>show</sup> clearly that  
neutral ~~for~~ salts have a power of  
dissolving the Blood. Further by destroying  
~~the~~ the Acid of the Stomach <sup>may</sup> Altho  
something it was absolutely necessary  
towards forming the Animal Fluids, & thus  
the dissolved state of the Blood. I believe  
all the Absorbent Vessels would act as  
powerfully in dissolving the Blood



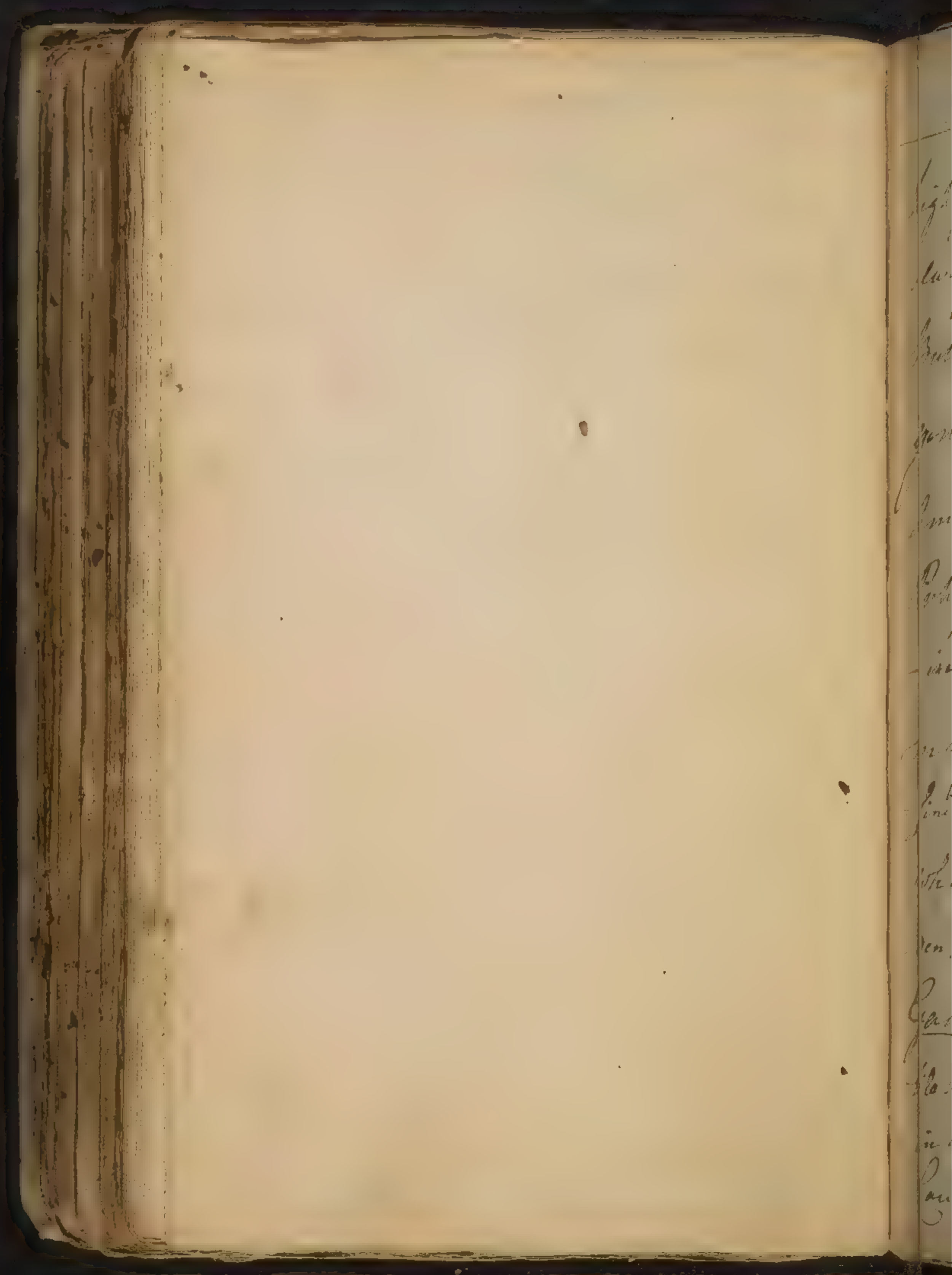
# 407

## Diseases of the Blood

as Alkaline salts merely by Abstracting  
the due proportion of Acid from our Fluids.  
— the observed Appearance of the Blood  
in the ~~cases~~ depends upon the same  
cause. viz. an Abstraction or want of  
Acid <sup>in</sup> usually entering into the constitution  
of our Fluids. I conclude then that no  
such thing as a fixed Alkali ever exists  
formally in our Blood.

But have we any proofs of a volatile  
Alkali in the Blood? we know that  
are means of changing fixed Alkalies into  
the volatile by the power of the system. There  
are means too of changing fixed Alkalies  
into volatile by means of Alcohol. May  
not the ~~parts~~ parts of our Fluids operate  
in the same way? — It appears then





highly probable that volatile Alkali is  
always present in Animal Fluids? -

But is ~~it~~ <sup>it ever</sup> in a separate state? we

generally find it in the form of an  
ammoniacal salt. But may not  
Putrefaction evolve it? - This is doubtful.

- in Cases of Gangrene a volatile Alkali

may be evolved, but it is always con-

joined to some other body; for, <sup>as</sup> soon as  $\frac{1}{2}$

whole mass of Fluid is affected <sup>with</sup> it, sud-

den Death is immediately brought on. Dr.

Gardner supposes in § 310 that a vola-

tile Alkali may be present in  $\frac{1}{2}$  Blood

in a separate state. & mentions  $\frac{1}{2}$  several

Causes <sup>which</sup> introduce it there. The 1<sup>st</sup> is the

121 and the filagueria of Bay.

61 For an an of the Finishes Rector see  
L. Bonhavi Chemistry.



# Diseases of the Stomach.

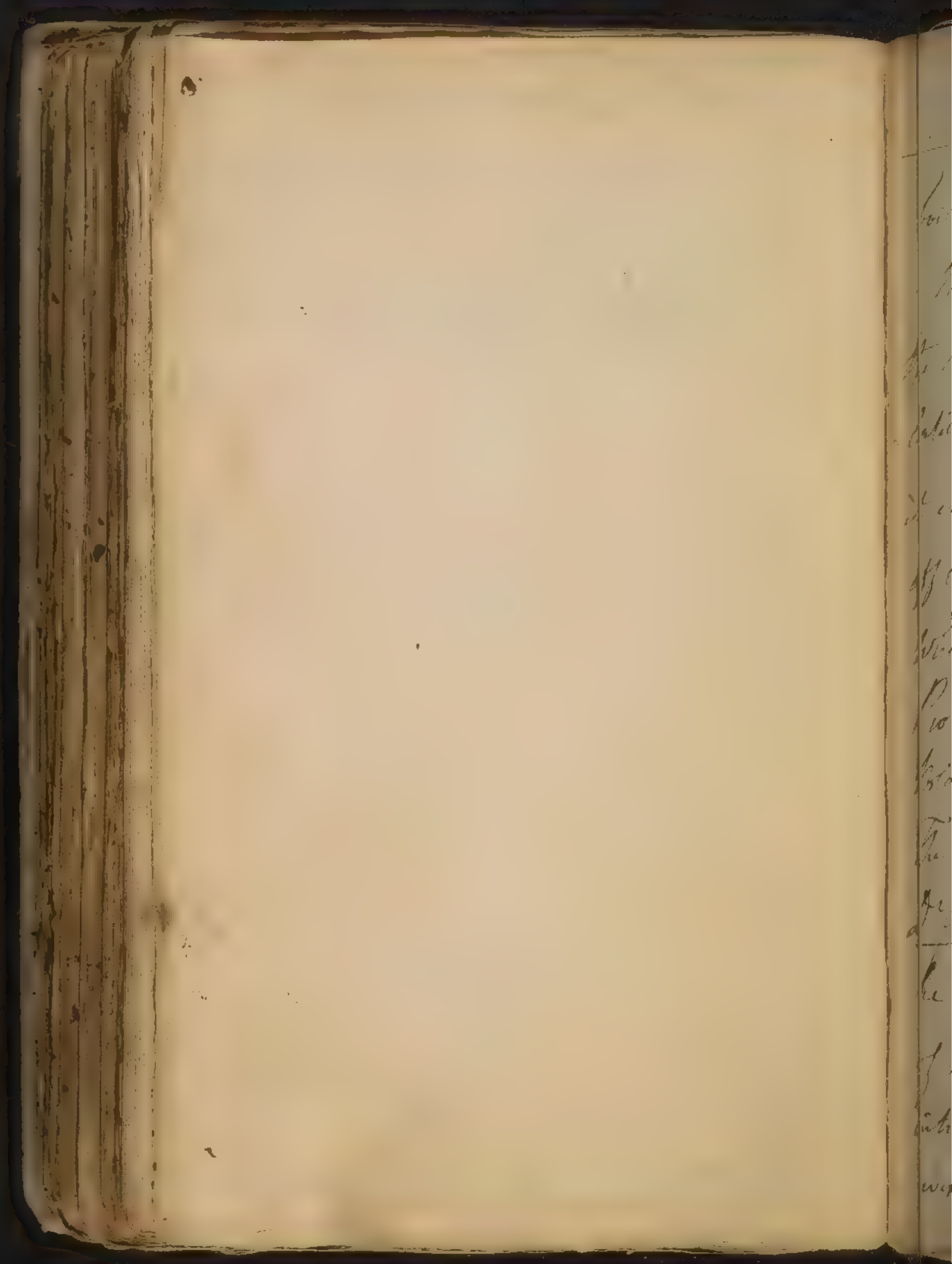
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use of vegetables abounding <sup>in</sup> Alkalie  
such as <sup>the</sup> Theridynamis of Linnaeus. But

I doubt whether these vegetables contain  
a volatile Alkali in an uncompounded  
state, but if they do it is in very small  
quantities, even we find their whole Power  
or Viribus Rectior <sup>by</sup> diffused by <sup>ing</sup> them.

But supposing it present in large  
quantities the Acid of the Stomach would  
immediately destroy it, nor ~~is it~~ <sup>are then kind of</sup> vegetables  
taken in the Body in <sup>sufficient</sup> Quantities  
to afford any quantity of such an Alkali.

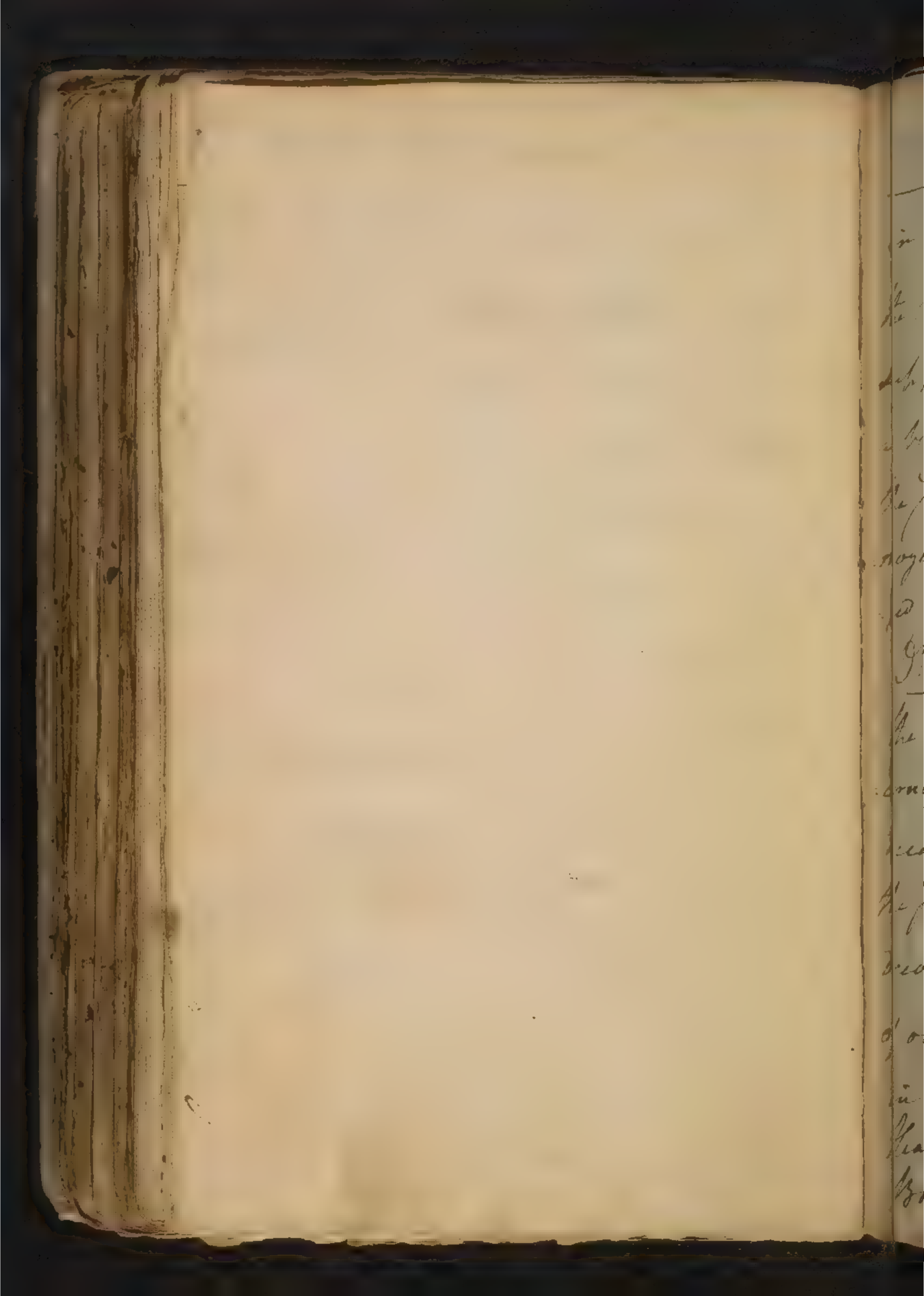
The Plants of the Theridynamia <sup>in</sup> we use  
most are the Trifolium in its various Forms  
& the Turnep. Now each of these contain  
but little acrimony after they have been



Diseases of the Blood 410

And it had been proved from them.  
But granting ~~that~~ <sup>that</sup> it enters  
the blood yet is it of so <sup>2</sup> stimulating & so  
calid that it soon vomits or purges or if  
it enters the blood it immediately flows  
off by insensible Perspiration. Upon the  
Whole I conclude there is no <sup>2</sup> East  
Probability of a Volatile Alkali in our  
blood from acid substances taken in.  
The <sup>2</sup> source of this Volatile Alkali w:  
I think is, <sup>the</sup> Volatile Alkali may  
be separated from a Ammoniac salt  
of the blood by means of a fixed Alkali  
introduced into the blood, but I deny that  
w<sup>o</sup> a fixed Alkali can enter <sup>the</sup> blood

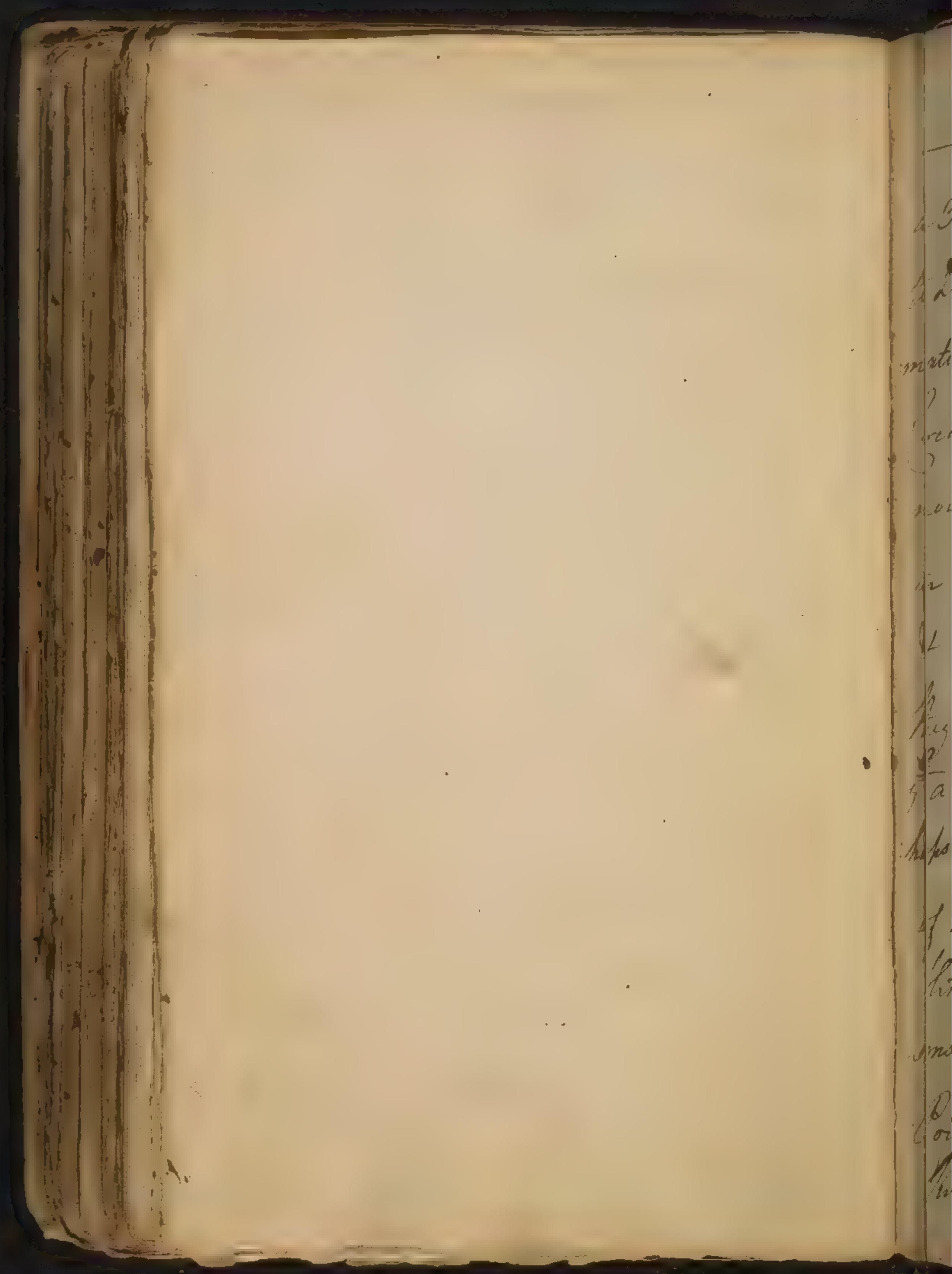




## Diseases of the Blood 411

in such a manner as to decompose  
the Ammoniacal Salt of our Fluids. even  
supposing the fixed Alkali did evolve  
a volatile Alkali from <sup>2</sup> Fluid effused in  
the Stomach, yet it would soon be de-  
stroyed by the acid of the Stomach, or dischar-  
ged by vomiting or purging.

Dr. Paulus speaks of soaps decomposing  
the Ammoniacal Salt, but all are said con-  
cerning the impossibility of a fixed Alkali  
decomposing it applies equally well against  
the soap. Nor are Earths capable of  
decomposing ~~for~~ the Ammoniacal Salt  
of our Fluids, for they never can operate  
in this way unless assisted by greater  
Heat than ever prevails in the animal  
Body.

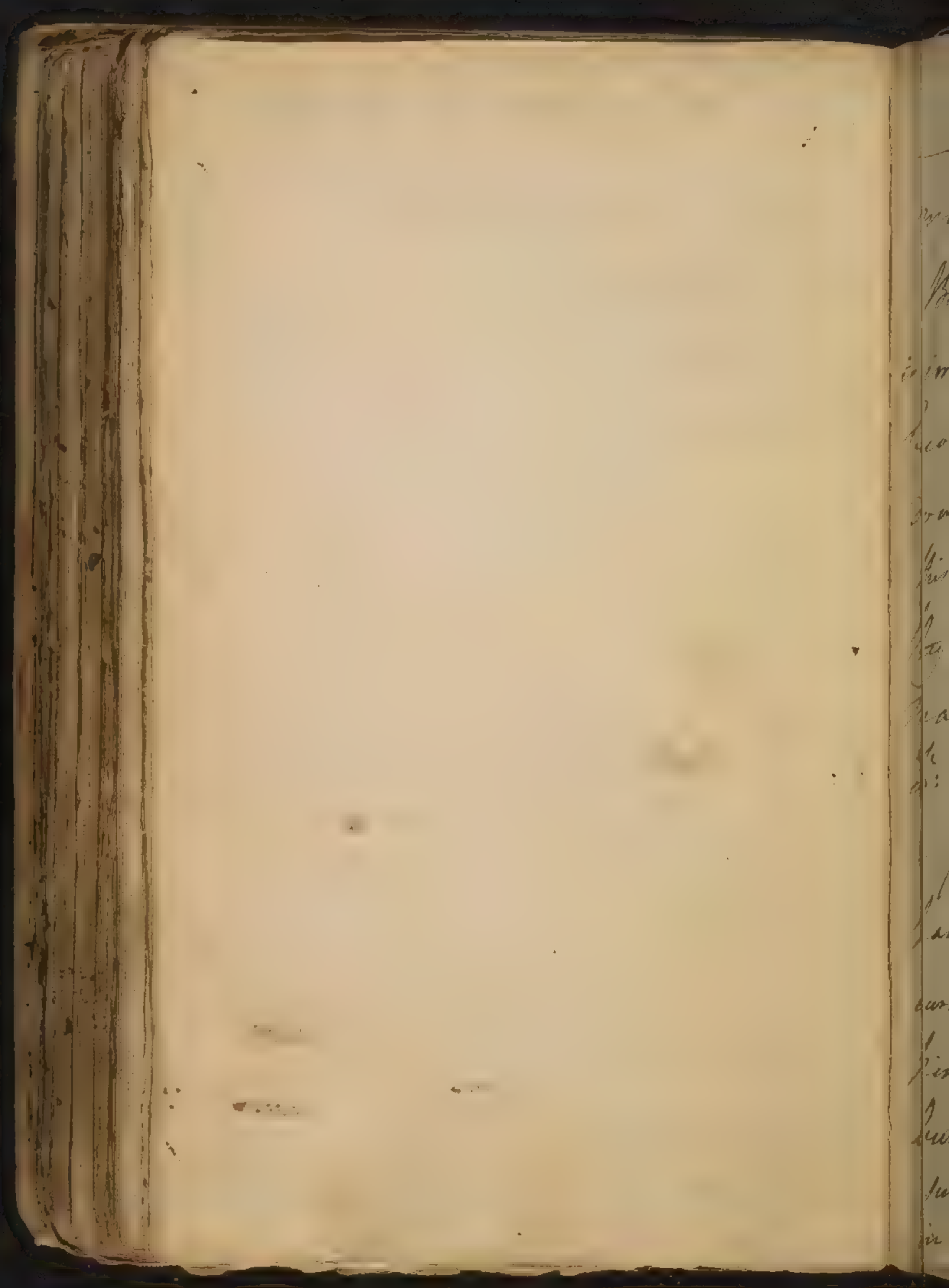




## Diseases of the Blood. <sup>412</sup>

a 3<sup>rd</sup> Cause of Volatile Alkali according  
to Dr. Gambius is the taking in of pro-  
matic Substances w<sup>ch</sup> by increasing the  
Circulation of the Blood evolves its Salts  
more copiously. But they are never taken  
in such Quantities, <sup>as</sup> to produce such Effects,  
It even supposing they did I deny that  
they have any tendency to decompose  
Ammoniac: Salt of our Blood, per-  
haps they may tend to increase of Quantity  
of this Salt.

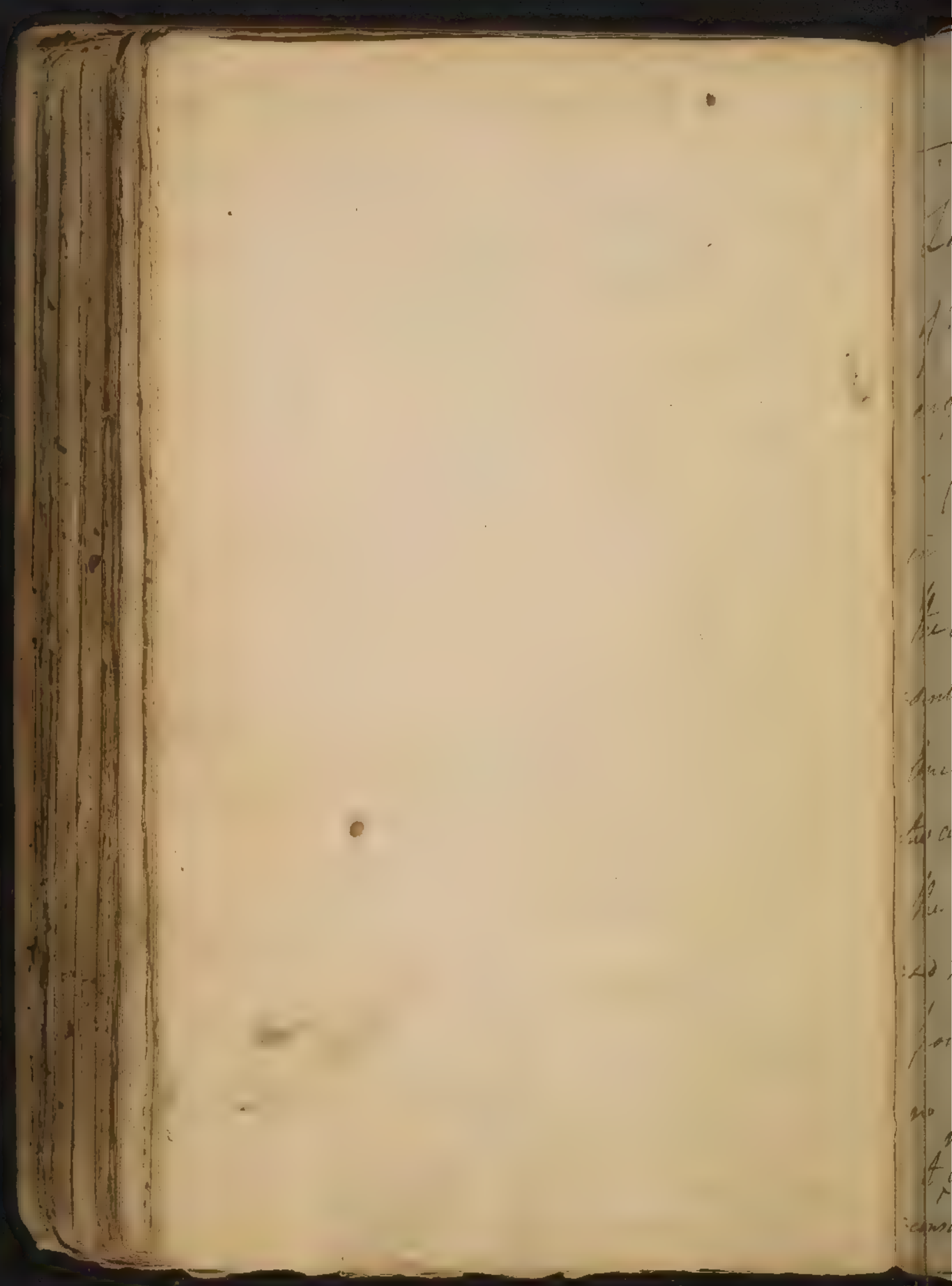
His 2<sup>d</sup> Cause of Volatile Alkali is Poi-  
sons taken into the Body. I grant some  
Poisons dispose our Fluids to immediate  
Putrefaction by w<sup>ch</sup> means a volatile Alkali



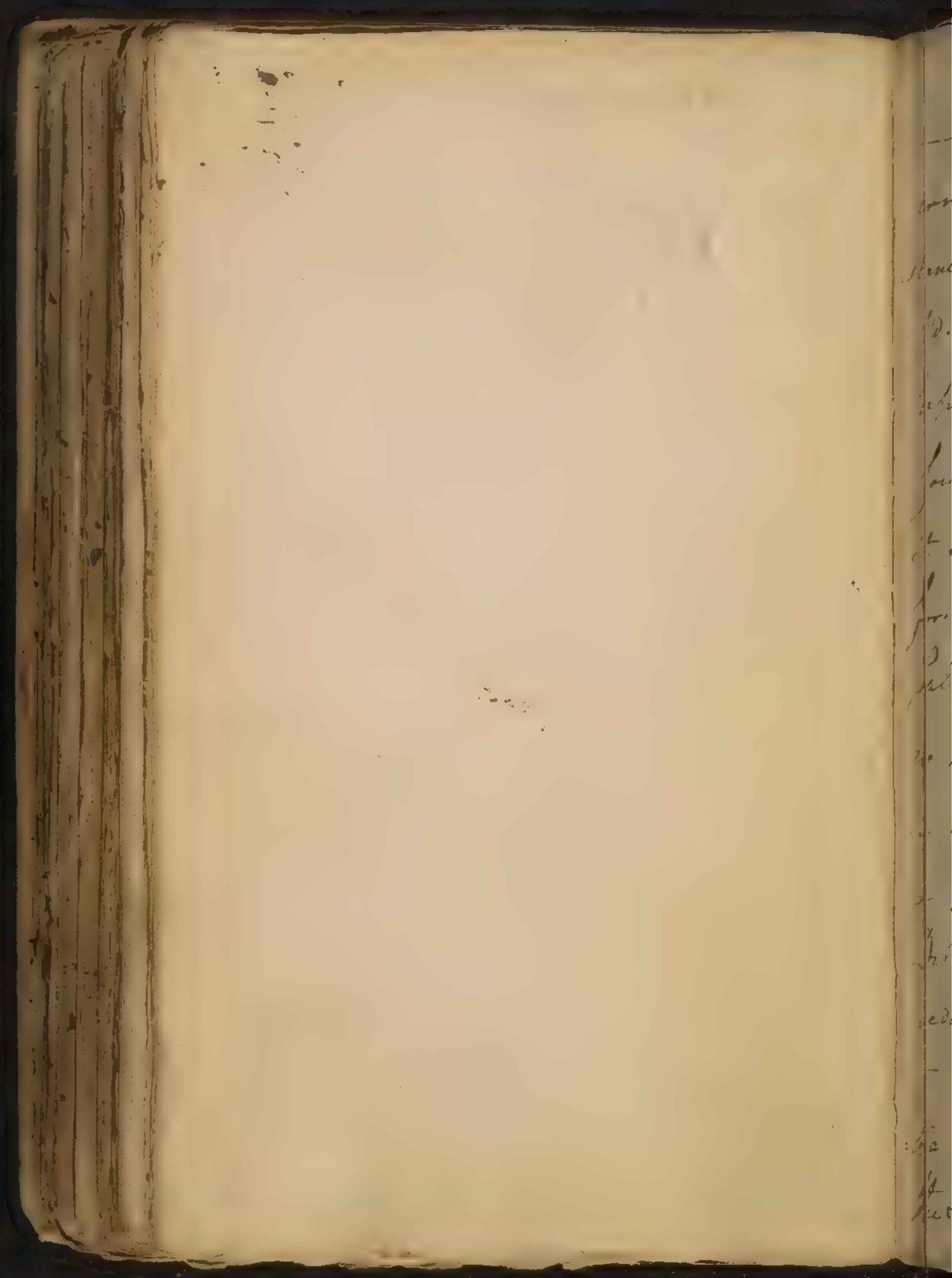
Diseases of the Blood. 413

may be evolved from the Animal Galts  
But when this is the case, sudden Death  
is immediately brought on & the Patient no longer  
becomes an Object of Physic. But I  
doubt whether the Poisons do induce  
this volatile Alkali. I rather suppose  
they operate on the Nerves in such a  
manner as to induce a sudden Storia  
or give rise to a Putrefaction of our Fluids.  
- I infer this from a Practice which  
has of late obtained in France of  
curing Persons of the most dreadful  
kinds of Poisons by nothing else  
but a free use of the vol. Alkali.  
surely then no vol. Alkali can exist  
in the Blood in these Cases.





Let us now enquire after the Presence  
of Neutral salts <sup>in</sup> our Blood. we shall  
enquire particularly after each of them.  
— I imagine few of them are ever found  
in the Body. They are most of them  
the Products of Art, few of <sup>em</sup> are pre-  
sented to us by Nature. There is but  
one of them introduced in such Quanti-  
ties as to remain in our Blood, except  
the muriatic salt. Dr Boerhaave suppo-  
sed the common salt was unchanged by  
powers of the Economy. But I know  
no Foundation for this Opinion. I grant  
it <sup>may</sup> appear in y<sup>e</sup> Urine. but in very in-  
considerable Quantities. The Urine is a

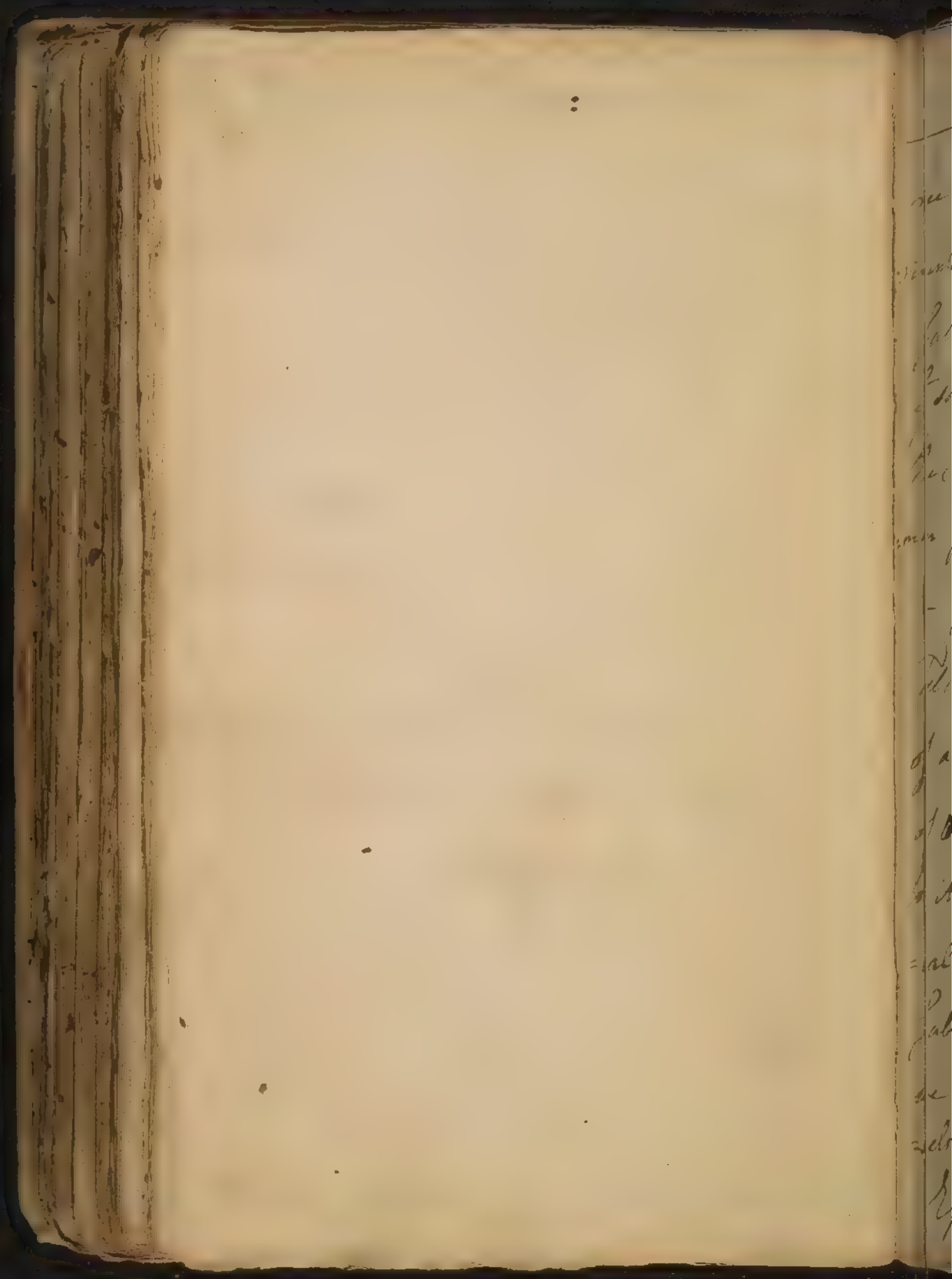




Diseases of the Blood. 415

compound <sup>the</sup> Mass abounding w<sup>th</sup> many sub-  
stances w<sup>ch</sup> Chemistry has not yet ascertain-  
ed. Margraff who has made many  
Experiments on the Urine. Has never  
found one thing like common salt in  
it. He found indeed other salts & knew  
former Chemists mistook for common  
salt. Upon the whole I think we have  
no proofs of the Cause of common salt  
in the Blood either from its causes  
or Effects. Dr. Gaubius ascribes many  
Diseases to it which certainly may be  
deduced w<sup>th</sup> more propriety from another Cause.

- Altho' it is taken in inconsiderable quantities yet such is the power of the Septum that it changes it after it is



received B into the body. Some late experiments in France teach us y. muriatic salt may be changed into Nitre. in the same manner I suppose the powers of the system are capable of changing common salt into ~~common~~ ammoniacal salt.

- I say further there is no salt in our fluids composed of a fixed Alkali, or of any of the four acids. The salt then of our fluids is of a nature peculiar to itself & appears to be of y. ammoniacal kind. This we know from such a salt always appearing in the urine w: we are <sup>sure</sup> formerly flowed in the blood of animals. It has been called the Essential salt of urine, but it may be



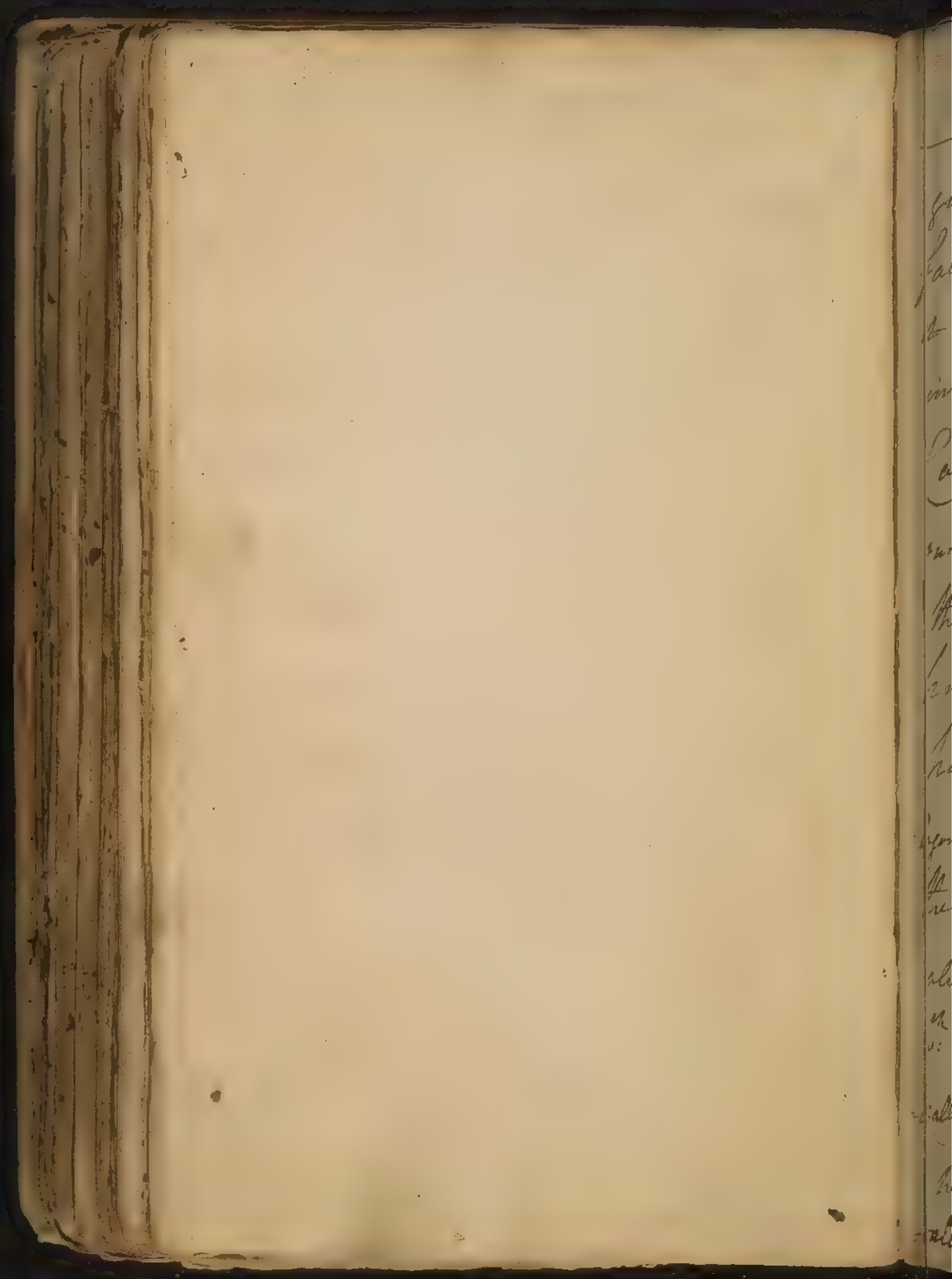
14. This Salt is Common to all Animals  
- even Vegetables have a Salt likewise  
- a Salt peculiar to itself.

16. When these Obstructions happen very  
suddenly they may occasion <sup>&</sup> predominance  
of this Salt in the Blood.

the equal property called the Essential  
or native  
Salt of Animal Fluids. See Dr. Gaubius

§ 316 who from his accurate know-  
ledge in Chemistry has pointed out this very  
Observation. The Predominance there-  
fore of Salts in our Fluids must al-  
ways be attributed to an excessive Quan-  
tity of the Mineral Salt. This In-  
crease in Quantity may depend upon

an Interruption of the Saline Secre-  
tions of Urine & Perspiration. But as  
these alternate so exactly with one another  
I imagine no very considerable Disease  
can arise from this Cause alone. We must  
therefore call in Other Causes to account for  
it. Dr. Gaubius supposes that the  
alkalies may



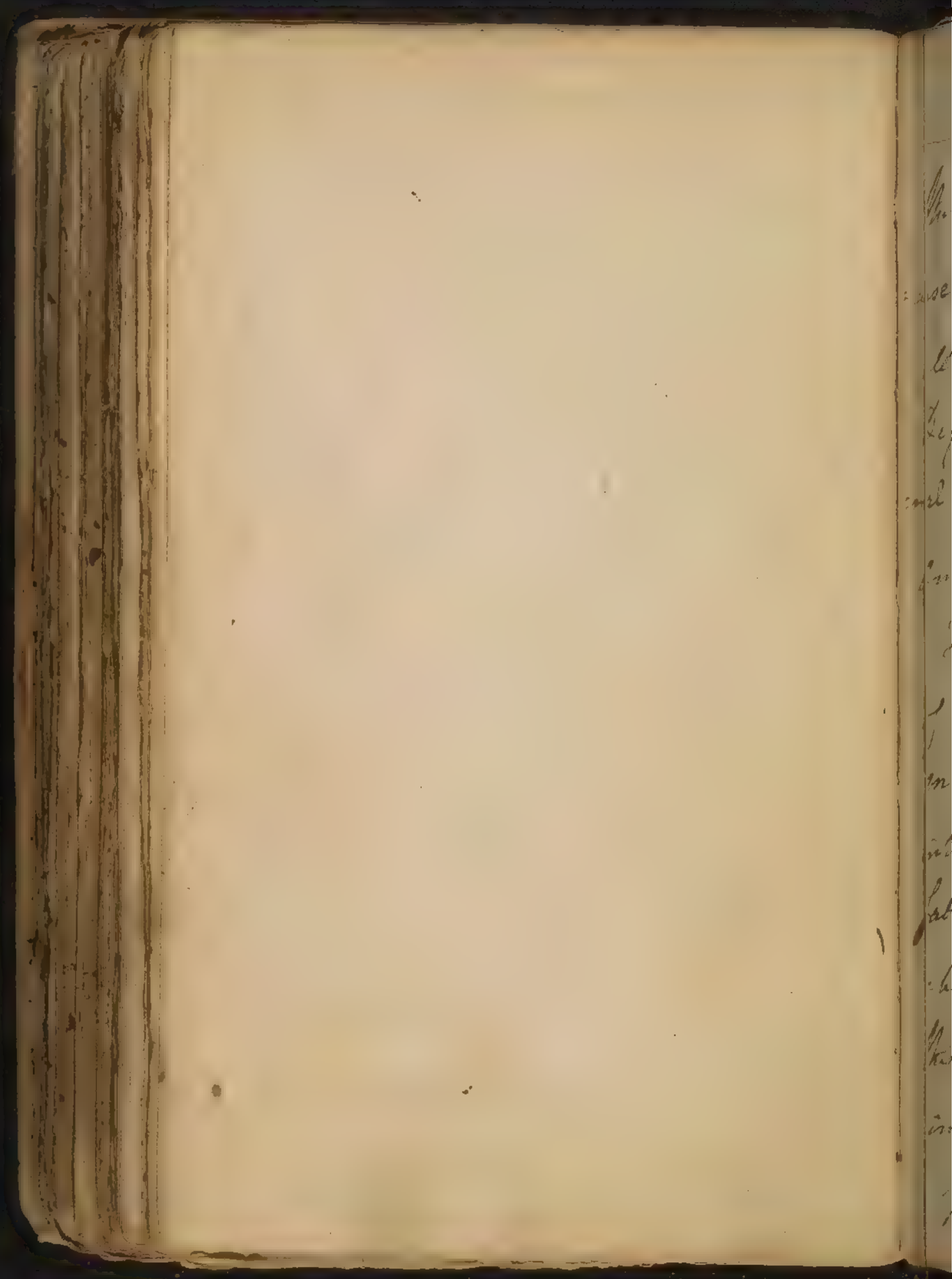


418

Diseases of the Blood.

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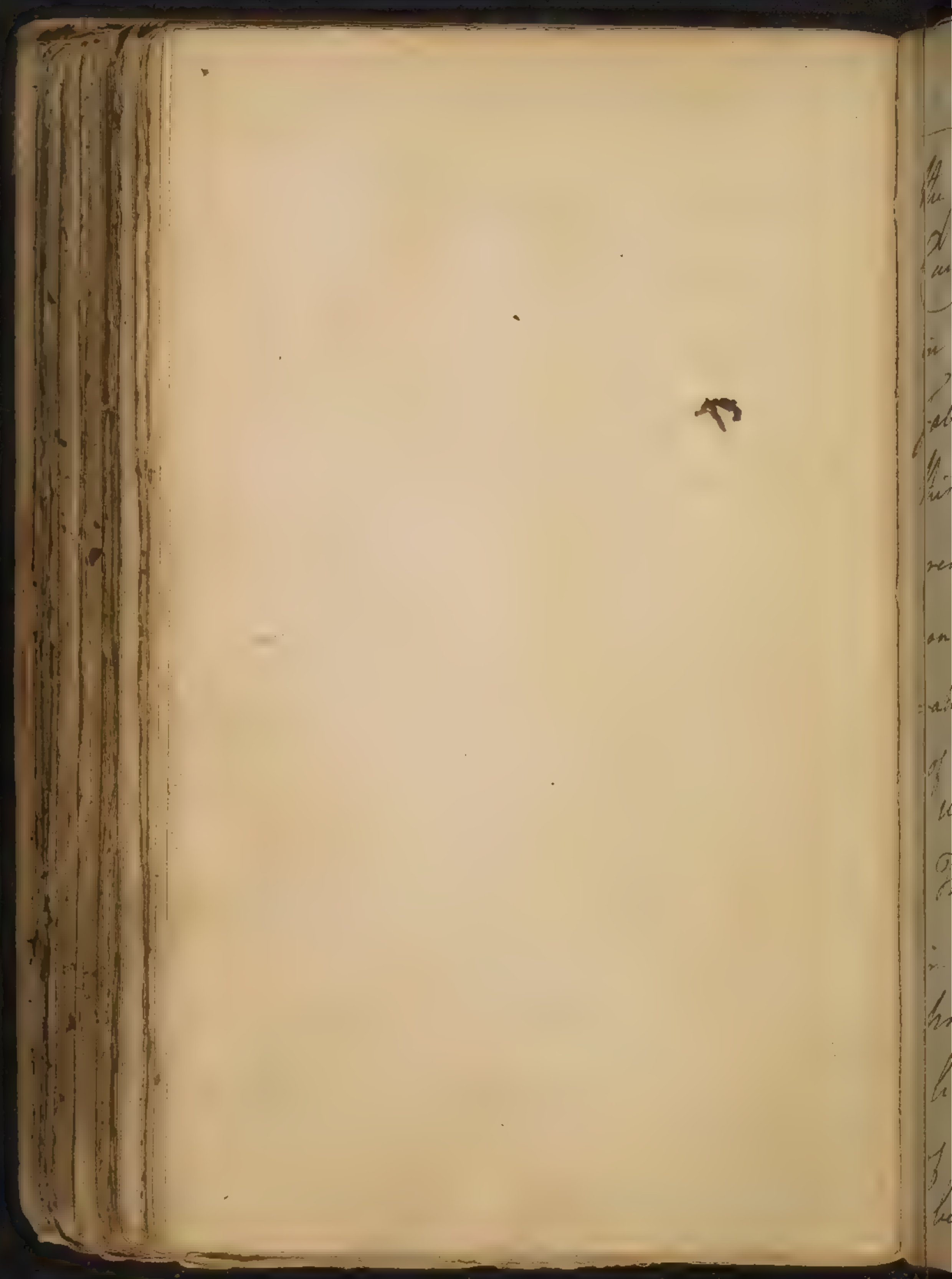
give this <sup>sub</sup>abundance of Ammoniacal  
Salt, but we shall soon prove that  
it depends upon a want of Lids,  
instead of an excess of them, & in those  
Cases where the Ammoniacal Salt of  
our Blood <sup>absorbs,</sup> there is no better <sup>Remedy</sup> for it than  
the free use of Lids. Putrefaction we  
now always evolve, <sup>a</sup> Salt of <sup>Ammonia</sup> common  
kind. Now we know something more  
beyond Putrefaction is going forward in  
the Animal Economy. But this Putrefaction  
always stops at a certain stage in <sup>a</sup> body  
it is occasioned by fresh Aliment <sup>es</sup> <sup>es</sup>  
really Aliment of a Vegetable Nature. The  
want then of Vegetable Aliment <sup>es</sup> <sup>es</sup>  
really gives rise to the Generation of



This ammoniacal salt. The same likewise produces the same effect, as also all animal substances: are advanced any degree towards Putrefaction. even animal food itself may tend to further this ammoniacal salt in greater quantity.

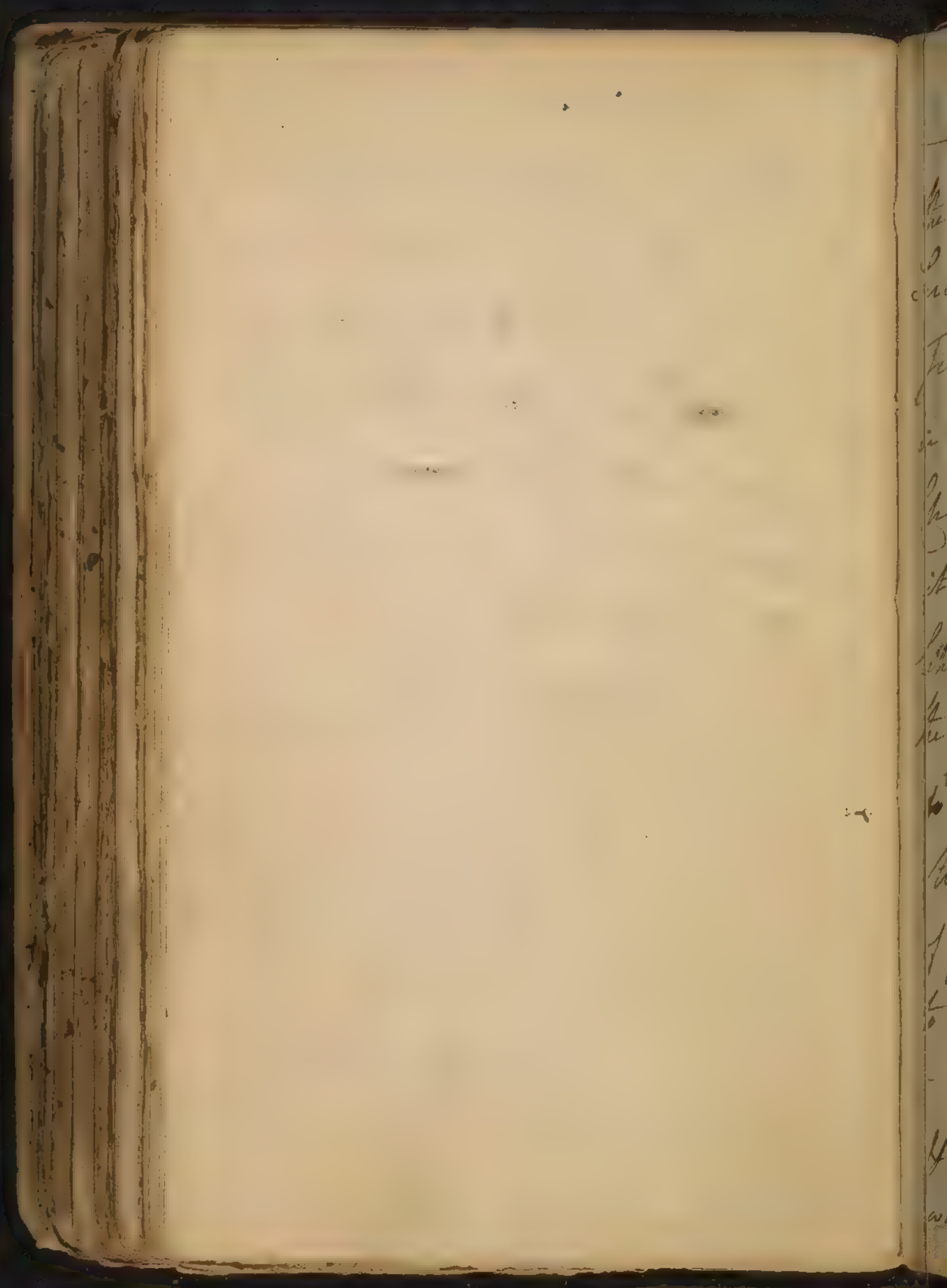
Of the causes of the superabundance of the Ammoniacal salt in the blood are many and Saline matters introduced into the body more especially Neutral salts which by the power of the system are changed into an ammoniacal salt. When this salt the juice of Alkalies may introduce this salt into the body by forming a neutral salt w<sup>ch</sup> is <sup>the</sup> <sup>kind</sup> of





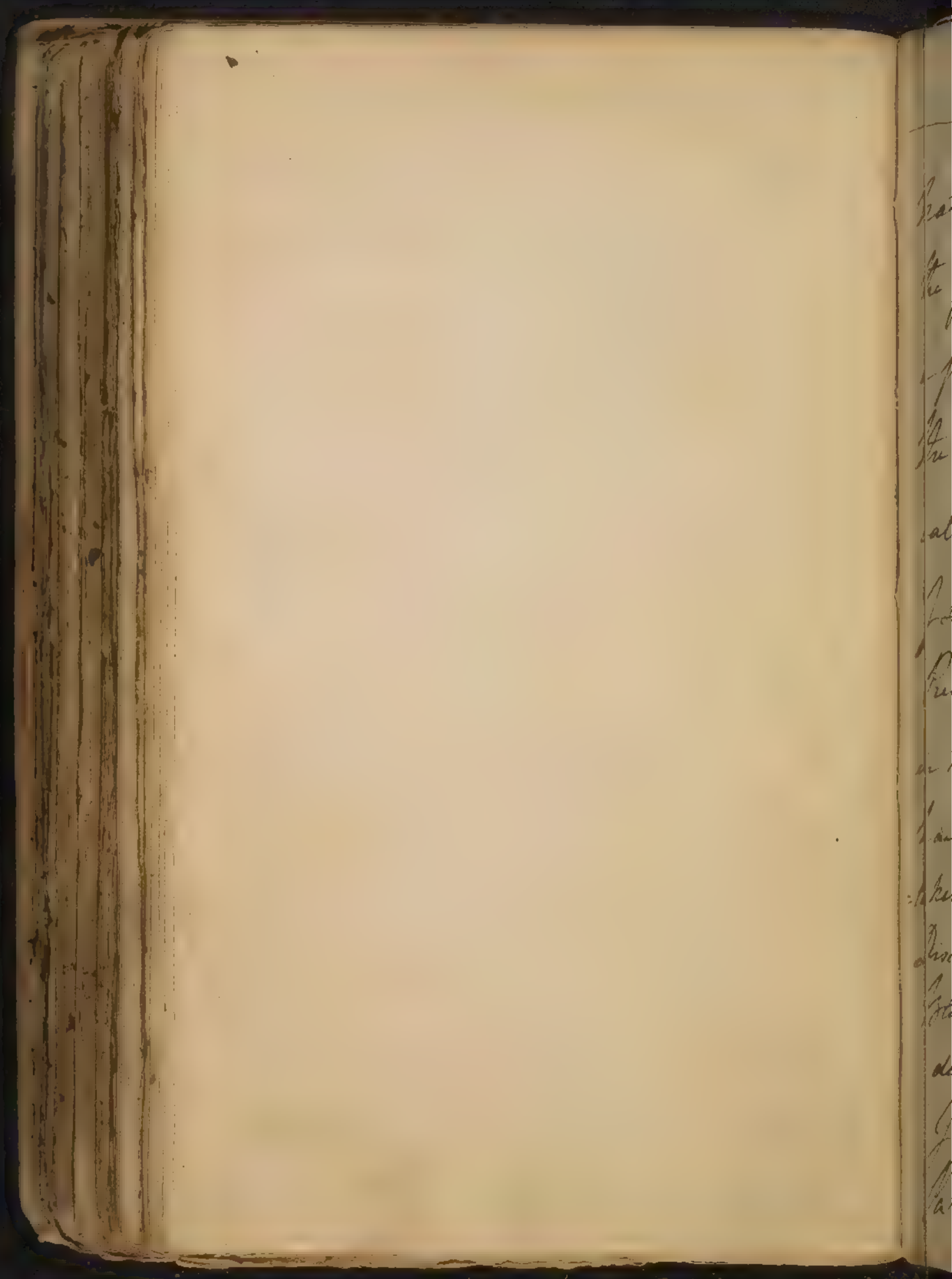
the stomach. But the most frequent Cause of this ammoniacal Urinary in our Blood is the use of a common salt in ~~too~~ <sup>too</sup> great quantities. From this you will easily ~~conceive~~ <sup>see</sup> the remote Causes <sup>the</sup> which are in bringing on the Scurvy. viz: Notwithstanding the want of Vegetable Food, the Use of Animal Food alone, & the excessive Use of Common salt.

The Presence then of an Ammoniacal salt in too great quantity constitutes the proximate Cause of the Scurvy. We may likewise understand the Phenomena of dissolved Acid Blood from what has been said, as depending entirely upon



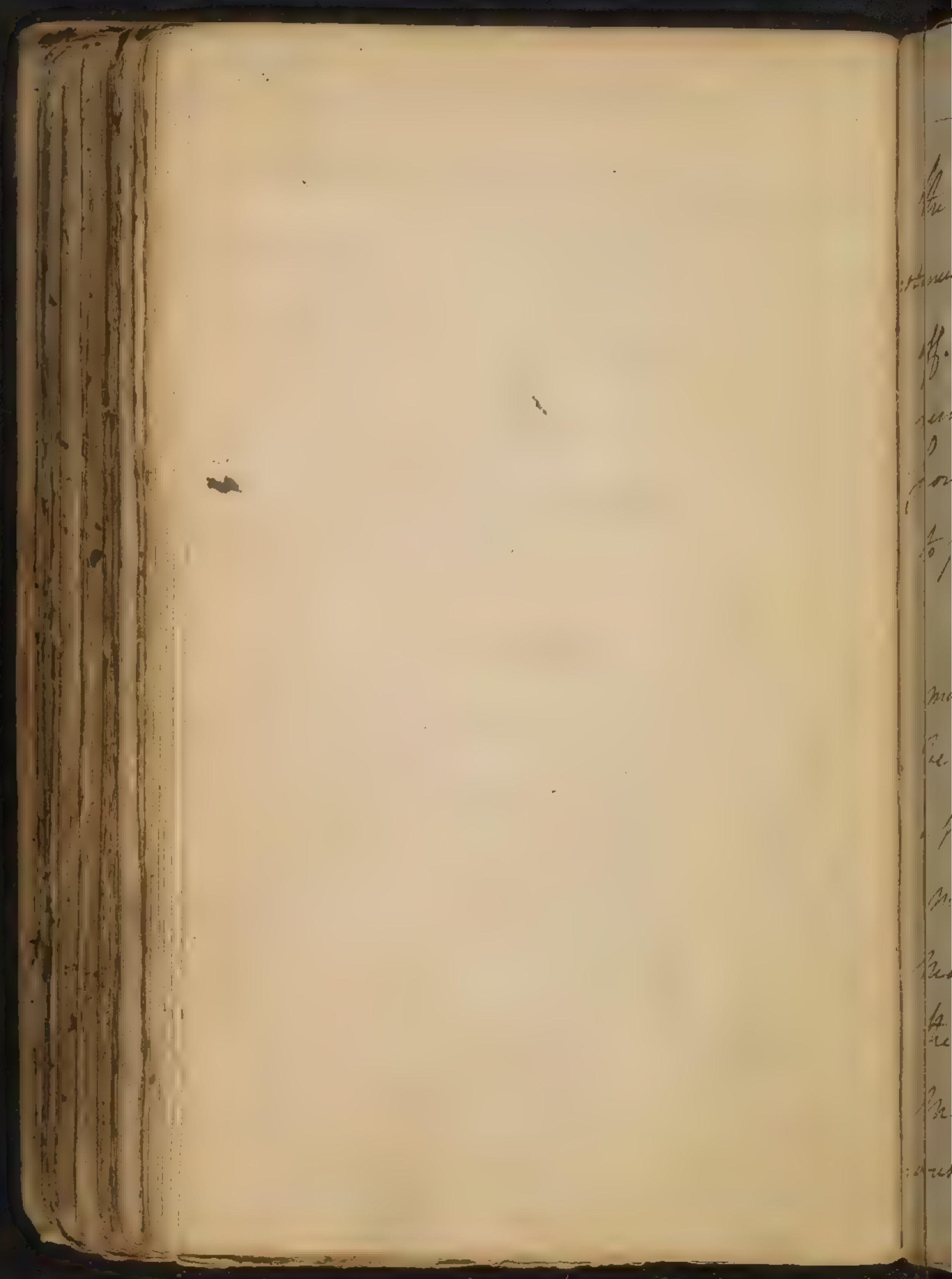


The Presence of Immunes. <sup>2</sup> It is y.  
Serum of the Blood. The Blood of  
Scorbutic Patients has been said to be  
in a putrid state, but it wants more  
Character to constitute it such, for  
it is not produced by Fermentation  
like all other putrid Masses, nor is  
the Disease contagious <sup>as it would</sup>  
be was it of a putrid nature.  
To this I may add that y. serum  
of Scorbutic Patients has been found  
to be a most powerful Antiseptic.  
- The flow proper of the Disease  
if the many Symptoms it is attended  
with, all show that it is not of a putrid



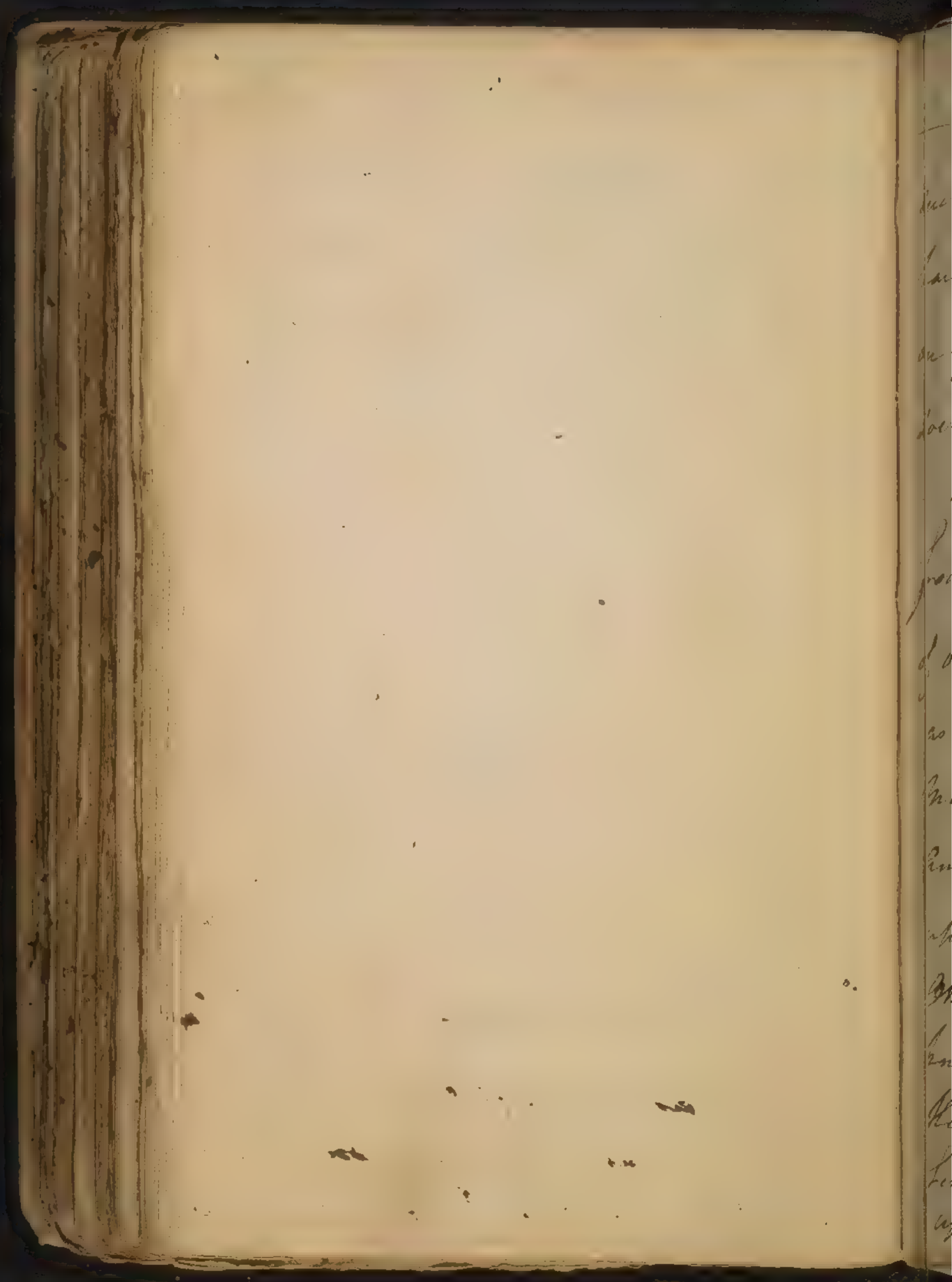
Nature. I affirm then that the blood in  
the fever is not putrid but may have  
a putrescent tendency. This state of  
the blood has likewise often been  
called an alkaline state, but ~~as~~  
I said before we have no proof of the  
presence of an alkali in any form  
in the blood. This humoral fallacy  
have been talking off has been mis-  
taken for it. DeGambius arrives many  
diseases to the alkaline state of the  
blood see § 311, but they may all be  
derived from other causes. For can  
I allow that the blood of scorbutic  
patients is in a putrescent state from





The arguments taken from <sup>the</sup> circumstances of fermentation we before spoke off. The argument <sup>is</sup> felt of the Blood & resist Putrefaction hence the reason why Scorbatic Patients are never subject to putrid Fevers.

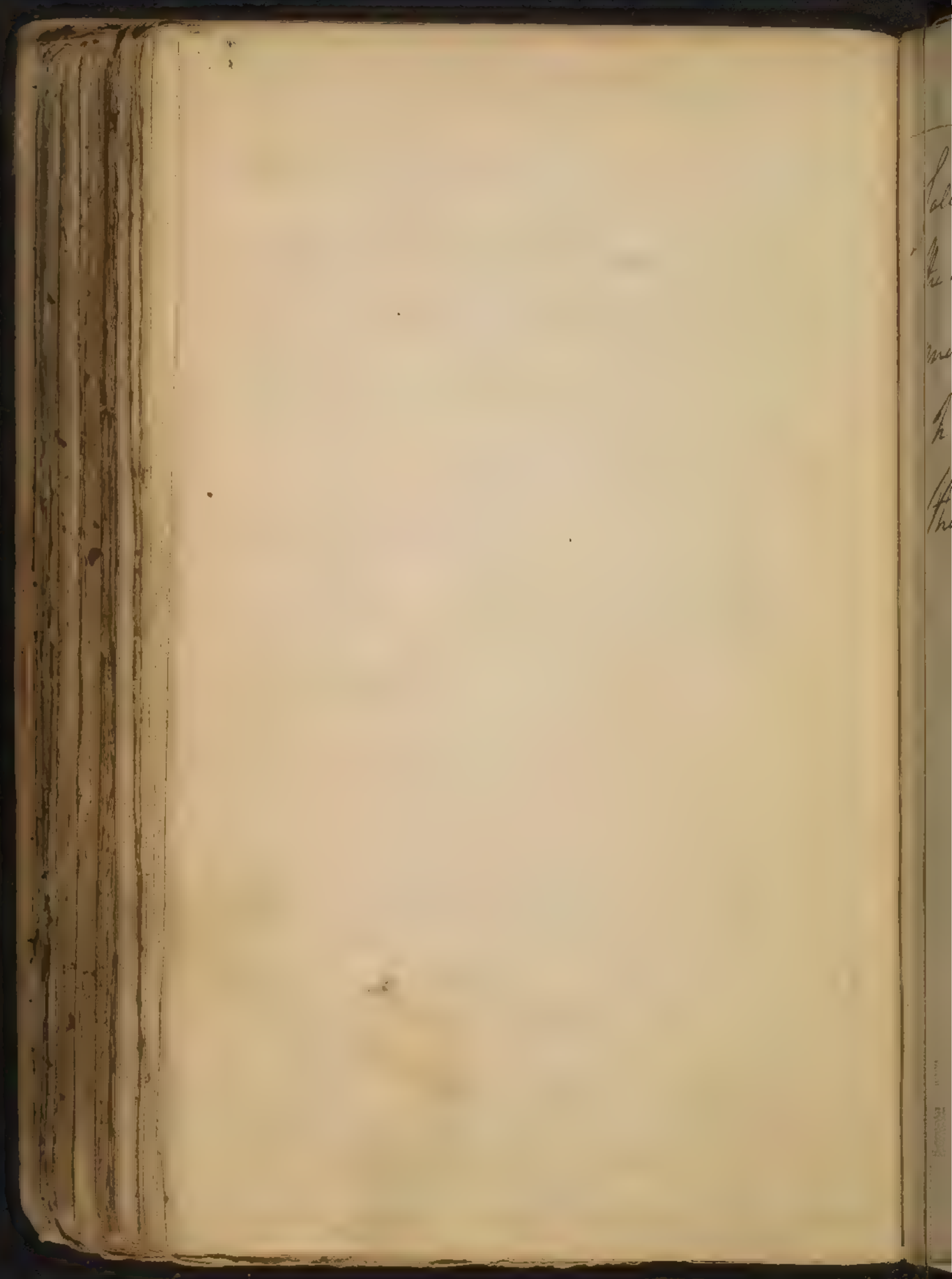
Contagions operate very differently. Most of them produce Fever except the venereal. all these Contagions are of a putrefactive kind, but very differently modified. Some of them produce a matter of a peculiar kind such as the small pox &c Others produce a matter <sup>the</sup> operate chiefly on the Nervous System only, & Others act <sup>in</sup> in





## Diseases of the Blood 424

such a manner as to make it  
hard to tell ~~on~~ whether they operate  
on <sup>the</sup> fluids or solids. But how far  
does the Putrefaction go in our fluids?  
- This question cannot be resolved  
from our great ignorance of <sup>the</sup> nature  
of our fluids & the nature of Putrefaction,  
as well as the various operations of those  
medicines which are supposed to act as  
Antiseptics. I ought here to confound  
upon the morbid deviations of each of the  
other fluids of this body, but as we  
know so little of their ordinary state <sup>in</sup>  
Health, as well as of the nature of  
fermentation to say any thing precise  
upon this subject. Dr. Gmelin has



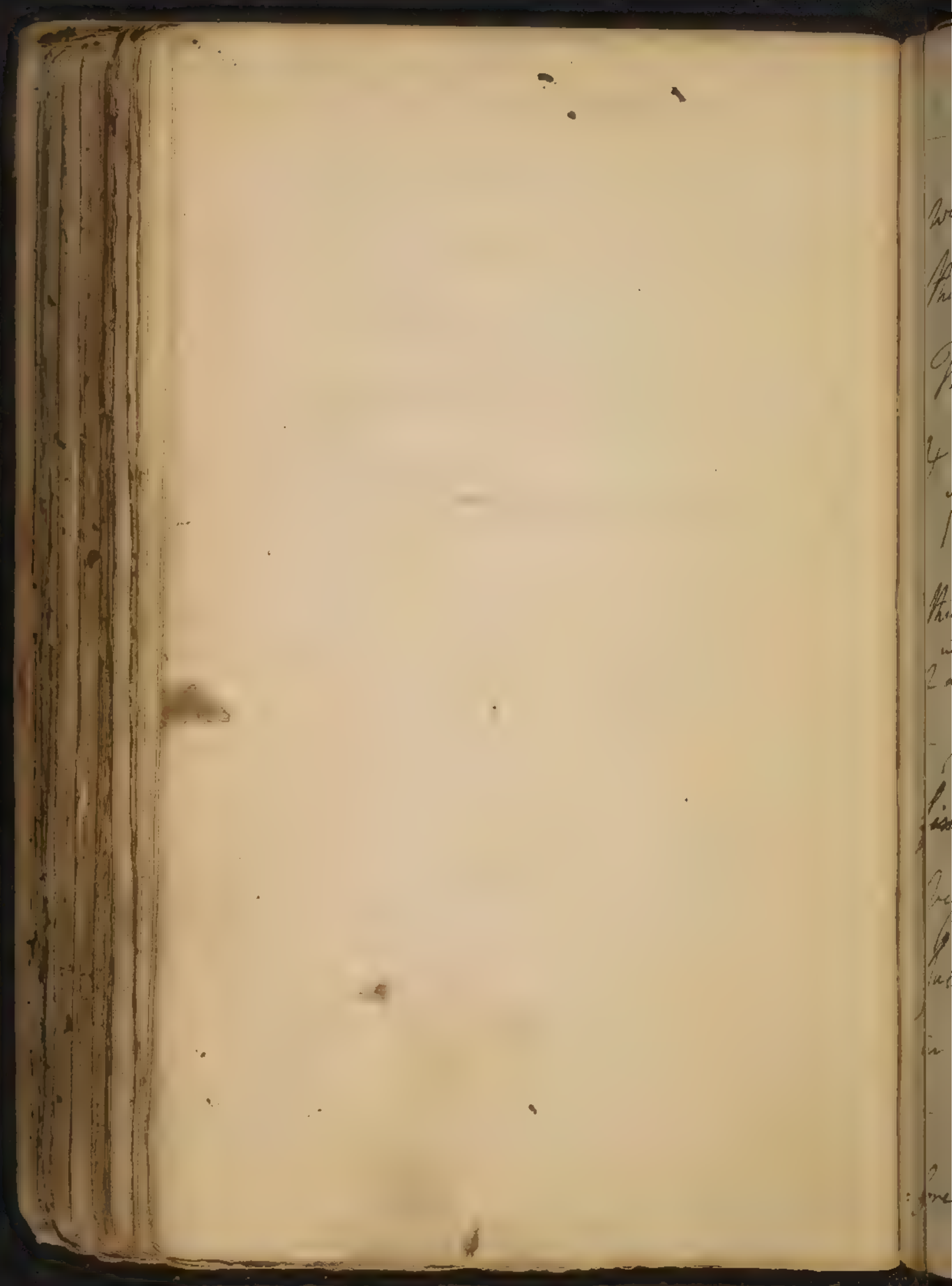
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Diseases of the Blood. 425

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fallen into error in treating when  
the Diseases of particular Fluids <sup>are</sup> <sub>is</sub>:  
most of you may easily detect. Thus  
have I concluded the Pathology of  
the Fluids considering by themselves.





426

## Relative Diseases of the Blood.

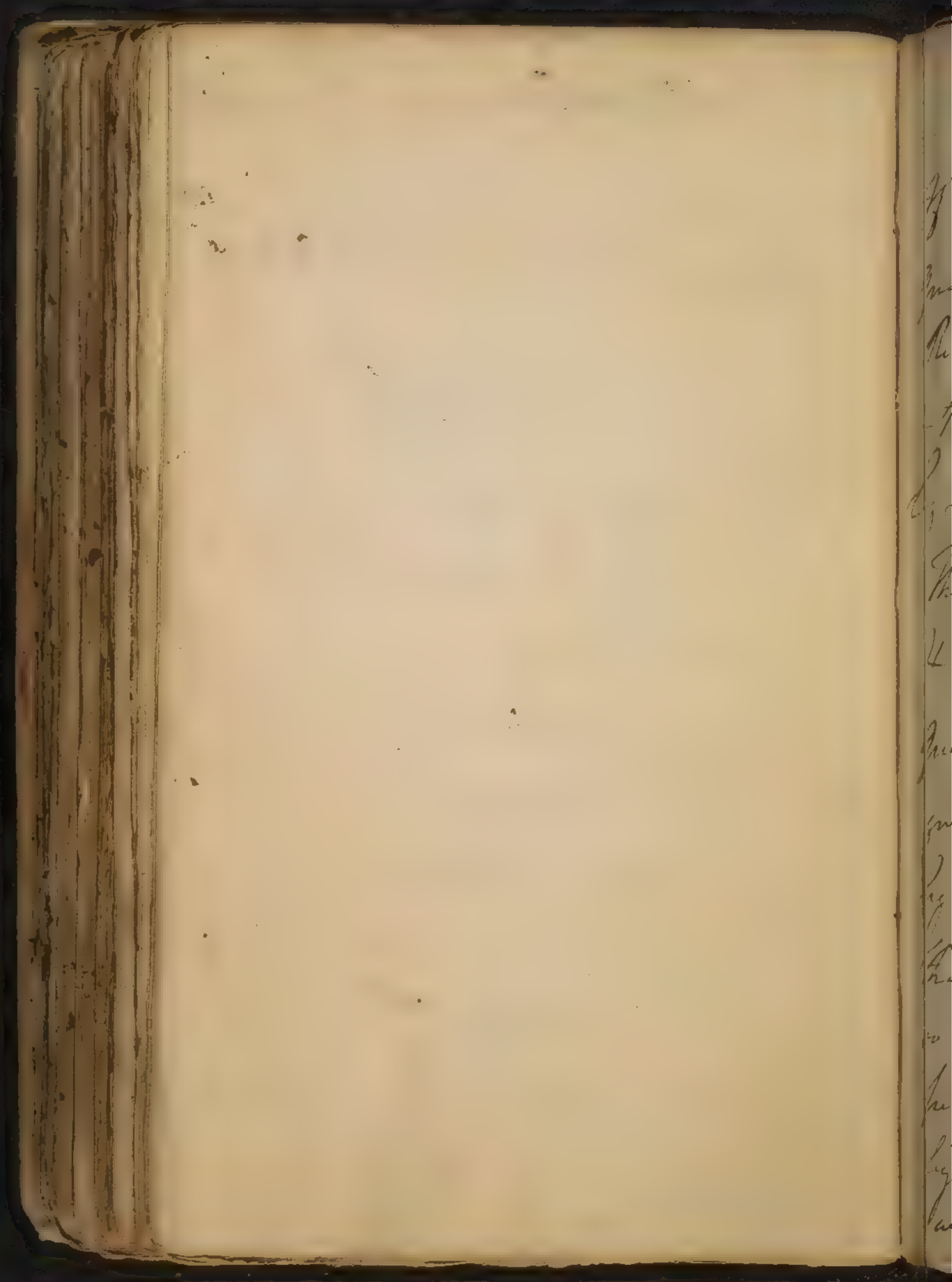
We shall now go on to consider  
the Relative Diseases of the Fluids.

The Fluids err in quantity, place  
& motion.

1<sup>st</sup> Quantity we shall consider  
this Quantity as relative to the solids &c.  
2<sup>nd</sup> as to the Arteries w<sup>ch</sup> contain them.  
- I shall consider the last only as the  
first has been hinted at before. The

Vessels containing Blood are always  
full & stretched, hence Blood <sup>vessels</sup> are <sup>more</sup> ~~more~~  
in the living than in the dead body.

- The Blood Vessels are flexible & there-  
fore may be more or less stretched.



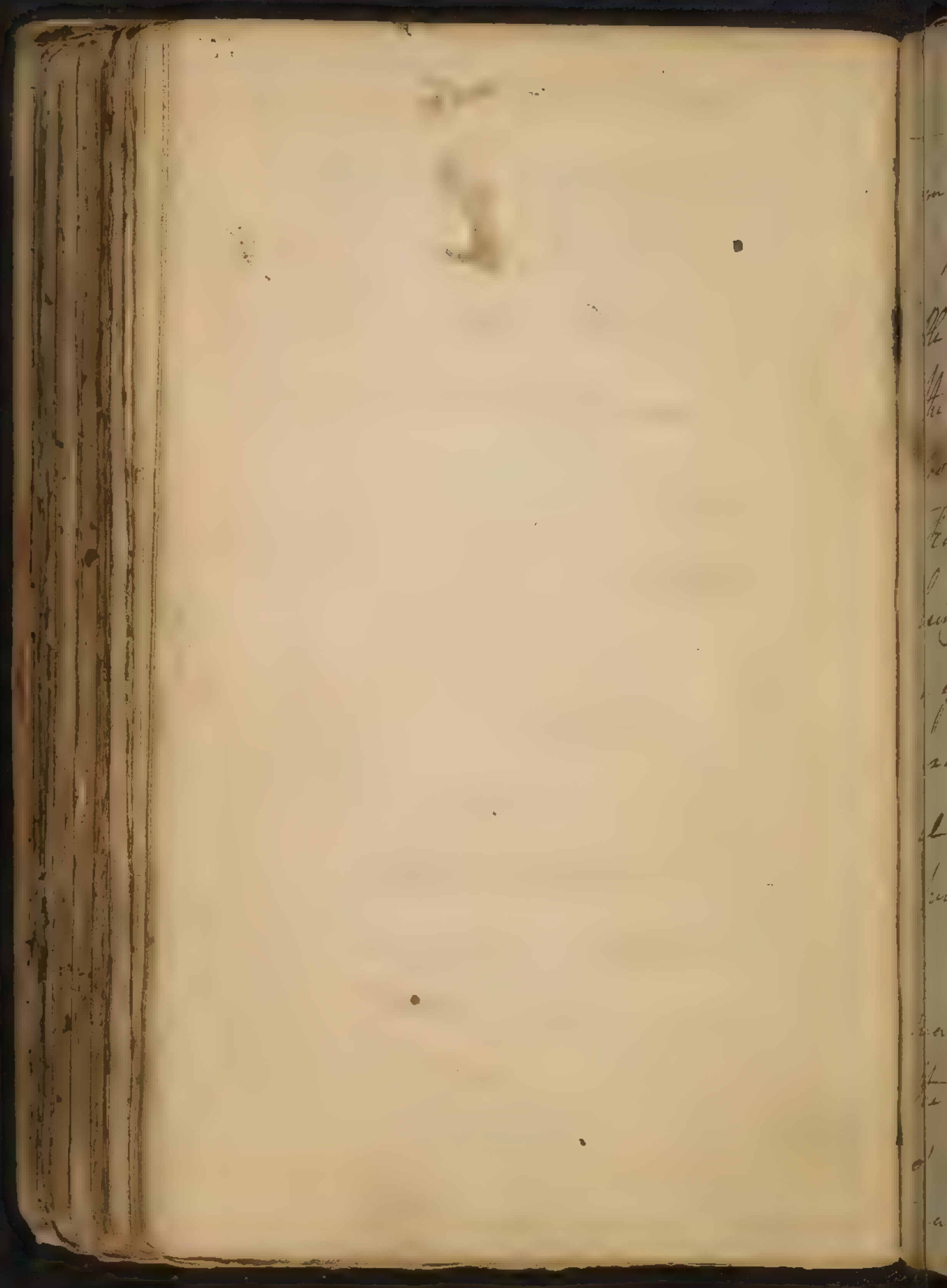


Relative Diseases of the Blood. 427

If the vessels yield too much an over-  
quantity of blood is produced & gives  
rise to a Disease called a Pethora.

- The Reverse of this has been called  
by Linnaeus Anemia.

The Pethora has been much studied  
& many Remedies applied to it. a greater  
quantity of Fluid than is necessary to  
give a proper tension to the System is called  
by Galenus "Pethora ad motum", but I  
think w<sup>th</sup> little propriety, - When it prevails  
so much as to prevent the Function being  
performed w<sup>th</sup> their usual ease it is called  
by the Ancients "Pethora ad vires", but  
we shall take no notice of this as it is



428

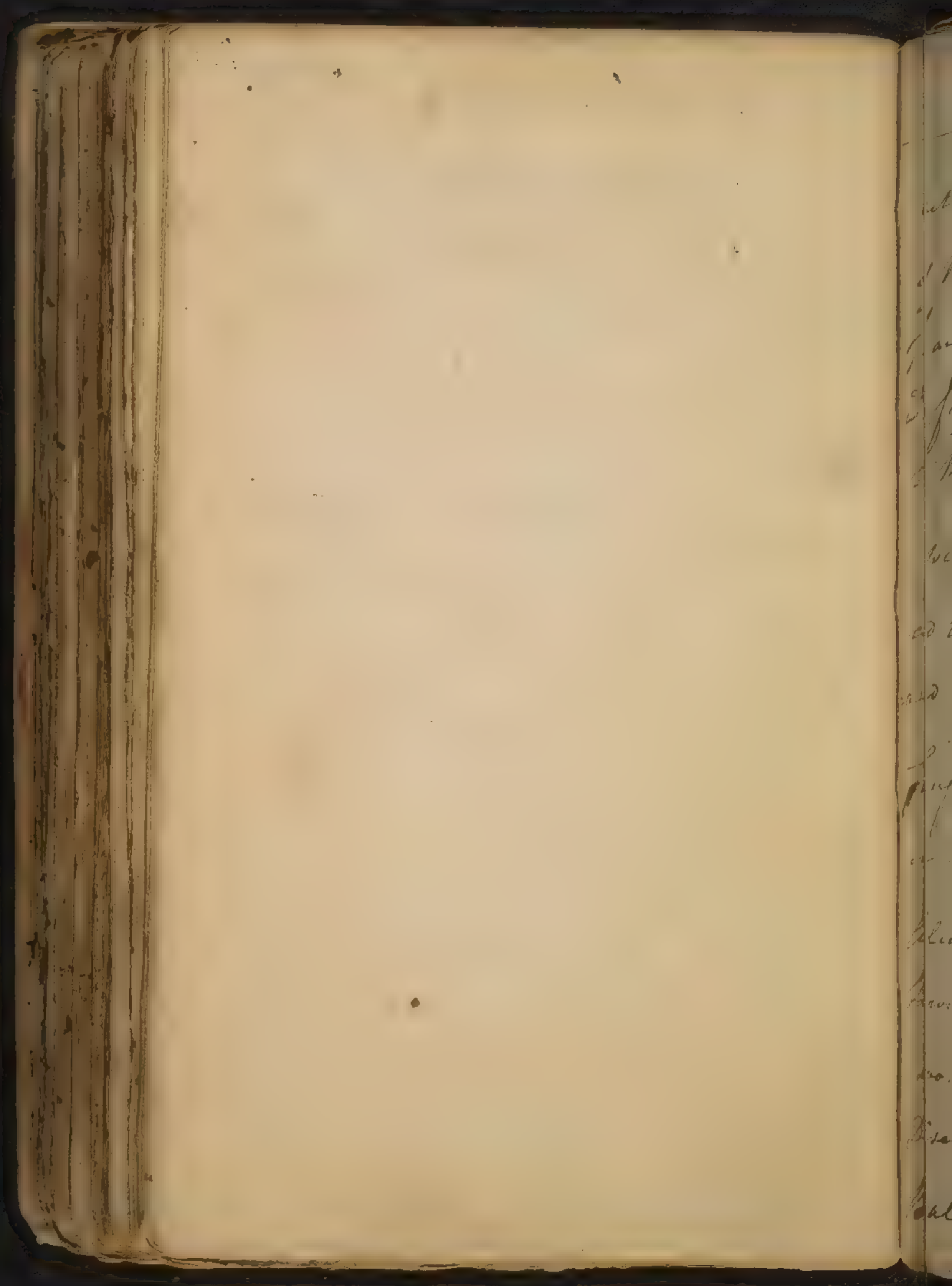
## Relative Diseases of the Blood.

only a higher Degree of "Plethora ad vasa."

But D. Galienus makes another Plethora called  
"Plethora ad volumen" <sup>in</sup> which is when the Quantity of  
the Blood is not increased but when either  
Column is increased either by <sup>an</sup> expansive  
Force of Heat, or by external pressure  
being taken off. This is sufficiently evinced from  
a great Number of Experiments <sup>made</sup> in an  
exhausted Receiver. But this Plethora must  
always be temporary, & can never give a  
permanent Disease.

Another Species of Plethora has been  
marked in <sup>which</sup> the Quantity & Volume of  
the Fluids continue the same but <sup>the</sup> Calidity  
of the Blood vessels is diminished. This is  
called "Plethora ad Spatium". This cannot





## Relative Diseases of the Blood 429

not universally in the system, so <sup>the</sup> <sup>Effects</sup> of this species of Plethora will only appear in particular portions of the System - the Plethora which follows amputated Limbs may be reduced to the Plethora ad Jacturam

we shall begin by considering the Plethora ad Bana or Plethora Bana which is an increased Quantity of Blood in the sanguiferous System. We are daily taking in <sup>our</sup>  $\frac{1}{24}$  of the weight of the ~~whole~~ <sup>the</sup> Body in Aliment. Now if this was not immediately absorbed but the Quantity of Fluid would soon be increased as to induce violent Diseases, but there is generally a due Balance kept up between the Supply

as there must be an increase of  $\frac{1}{4}$   
power of the <sup>th</sup> Ant. v. <sup>e</sup> Regard to <sup>e</sup> Resistance  
as the blood is not absolutely  
confined, but allows the blood to pass  
off further there must be a kind of  
balance between the Excretor. v. v.  
small arteries & the great vessels and  
Heart. If a ready passage was allowed  
into the veins the Arteries system w:  
never be distended & exhausted. we have  
many proofs of the Density of the veins being  
greater in the begin<sup>g</sup> of Life than that  
of the Arteries, & the Resistance of the  
Arteries has also the same Effect. It is  
easy to see that these are greatest at



## Relative Diseases of the Blood. <sup>430</sup>

& Plethora, if this is destroyed a Plethora will  
naturally succeed. The System itself is at  
particular times disposed to this inequality  
between the Ingesta & Excreta. I formerly  
explained that an accumulation of Fluid was  
necessary to the Growth of the Body. This  
accumulation takes place in the Arteries  
System. The Lymphatic System acts upon it  
is acted upon. as before the Body arrives  
at its home all Plethoric Arteries  
some time after that, joined they become  
venous. Unless this intermittent accumula-  
tion takes place in the Veins Obesity  
follows hence the Reason why people  
grow fat most in middle age. The Bal-  
ance of the System will vary i. at some

first, & that the Ballance will be con-  
stantly changing as the parts are stretched  
& the Dilatation will always be in those  
parts of the Arterious System <sup>which</sup> are most  
distant from the Heart as being weaker.  
~~Otherwise~~ the Force of the Heart & large  
Arteries would constantly tend to increase  
in proportion. So long as a Difference  
is considerable the Imperfection however  
Effects but at the same time there is a kind of  
Pléthora & Spatium, & the Effect of the  
Imperfection must depend all along on the  
Ballance of the Veins & Reaction of the  
~~Arteries~~ Excretories. As the Excretories  
are first opened we may suppose they require  
revolving Force, & so we find they do. &c.



## Relative Diseases of the blood. <sup>431</sup>

1<sup>st</sup> Manhood is about 36 3<sup>rd</sup> an intermediate  
state from 36 to 50 during <sup>the</sup> time Men-  
struation ceases in women. 4<sup>th</sup> From 50 upward.

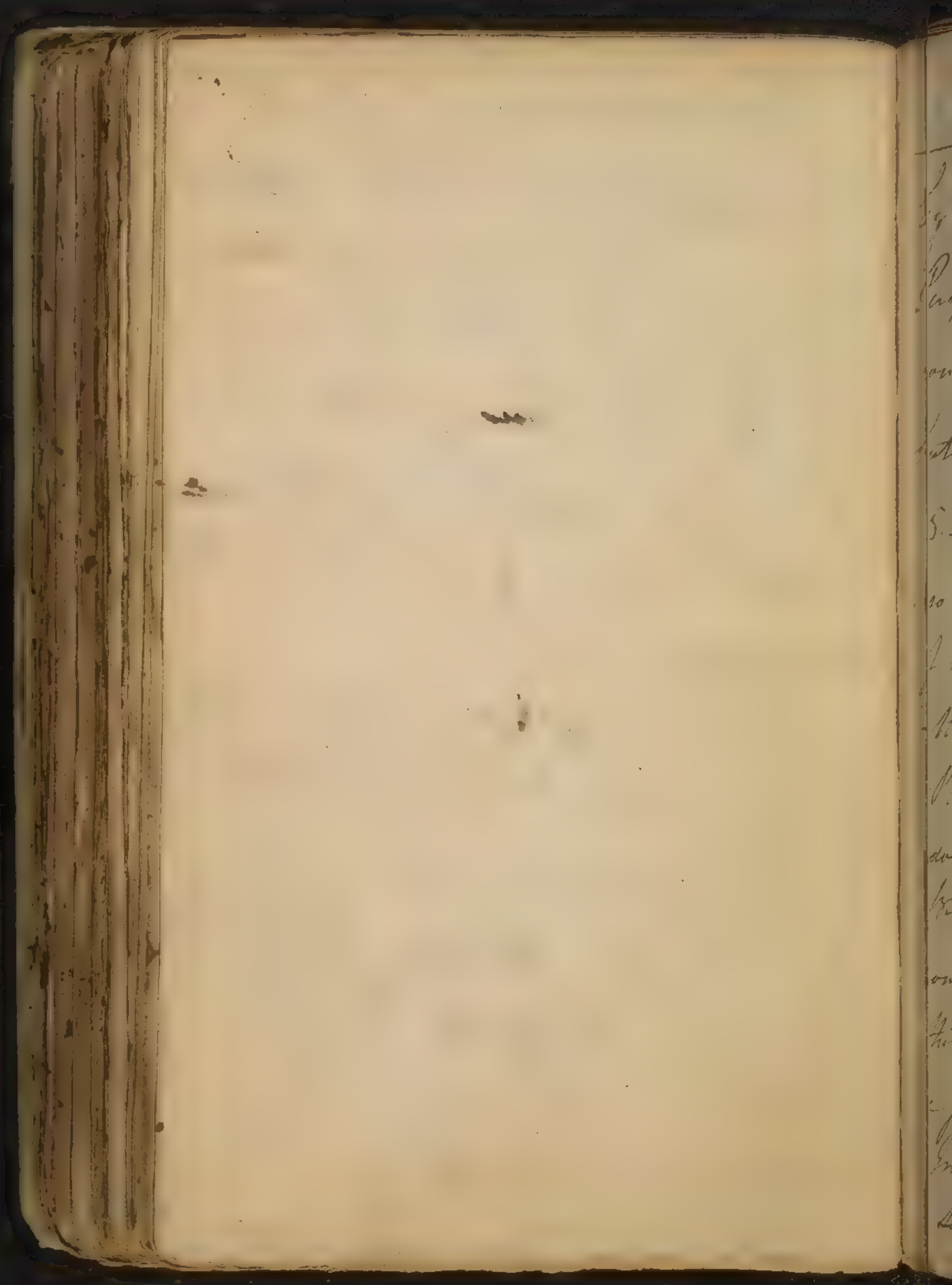
The Occasional Causes of Plethora then  
are - 1<sup>st</sup> A larger proportion of Aliment  
joined w<sup>th</sup> stronger Cybotetic Organs than  
the excretory Organs.

2<sup>nd</sup> Aliment will always induce Ple-  
thora, it is more nourishing & less per-  
ishable.

3<sup>rd</sup> Aliment the being given Plethora  
will depend upon Exercise, for the less  
of this is used the less the excretions  
are & greater the accumulation.

4<sup>th</sup> Cold w<sup>th</sup> may act in inducing Plethora





432

## Relative Diseases of the Blood

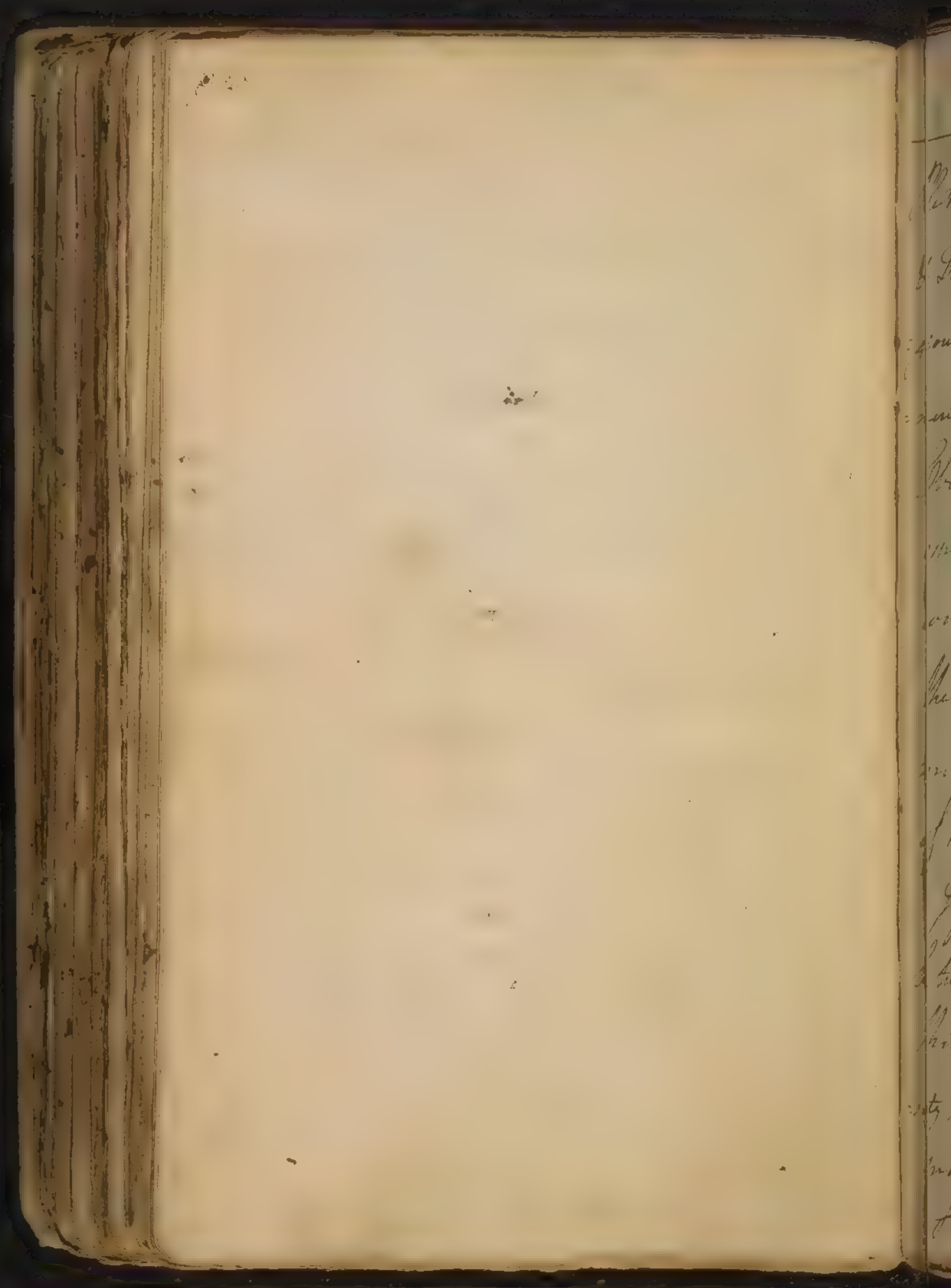
by diminishing the secretions especially  
Perspiration. These then are the most  
commonly marked causes of Plethora  
but we must add to them.

S. Vacuations. How do these operate  
so as to induce a Plethora? The vacuation  
I refer to here is Artificial Blood-letting.  
Nothing we know disposes more to the  
Plethoric state than this. Small bloodletting  
does not produce Plethora so much as copious  
Blood Letting from the disposition of the solid to  
contract themselves. But Dr Gaubius has pushed  
this method of Reasoning too far. If we take  
a string of 10 inches long & stretch it one  
inch more by a weight appended for  
several days, this string will not contract





it all to its former length, <sup>at least for a considerable</sup> ~~time~~ <sup>thus it is w y.</sup>  
 fibres of our vessels. if the stretching powers  
 are taken off gradually from the solids  
 they soon accommodate themselves to the  
 fluid, but if the tension is suddenly taken  
 off it is impossible for them <sup>to</sup> contract. hence  
 a Laxity is induced. ~~to~~ in consequence then  
 of Blood-Letting the Flexibility of Arteries  
 is encreased while the Evacuations continue  
 the time, by this means a Plethora is  
 induced. It is owing to this that y<sup>e</sup> Loss  
 of Blood is so soon repaired by y<sup>e</sup> system.  
 - The Evacuations by means of Blood-Letting  
 acquire an encreased contraction which  
 tends still further to produce the plethoric  
 State. By w<sup>h</sup> means do we judge of the



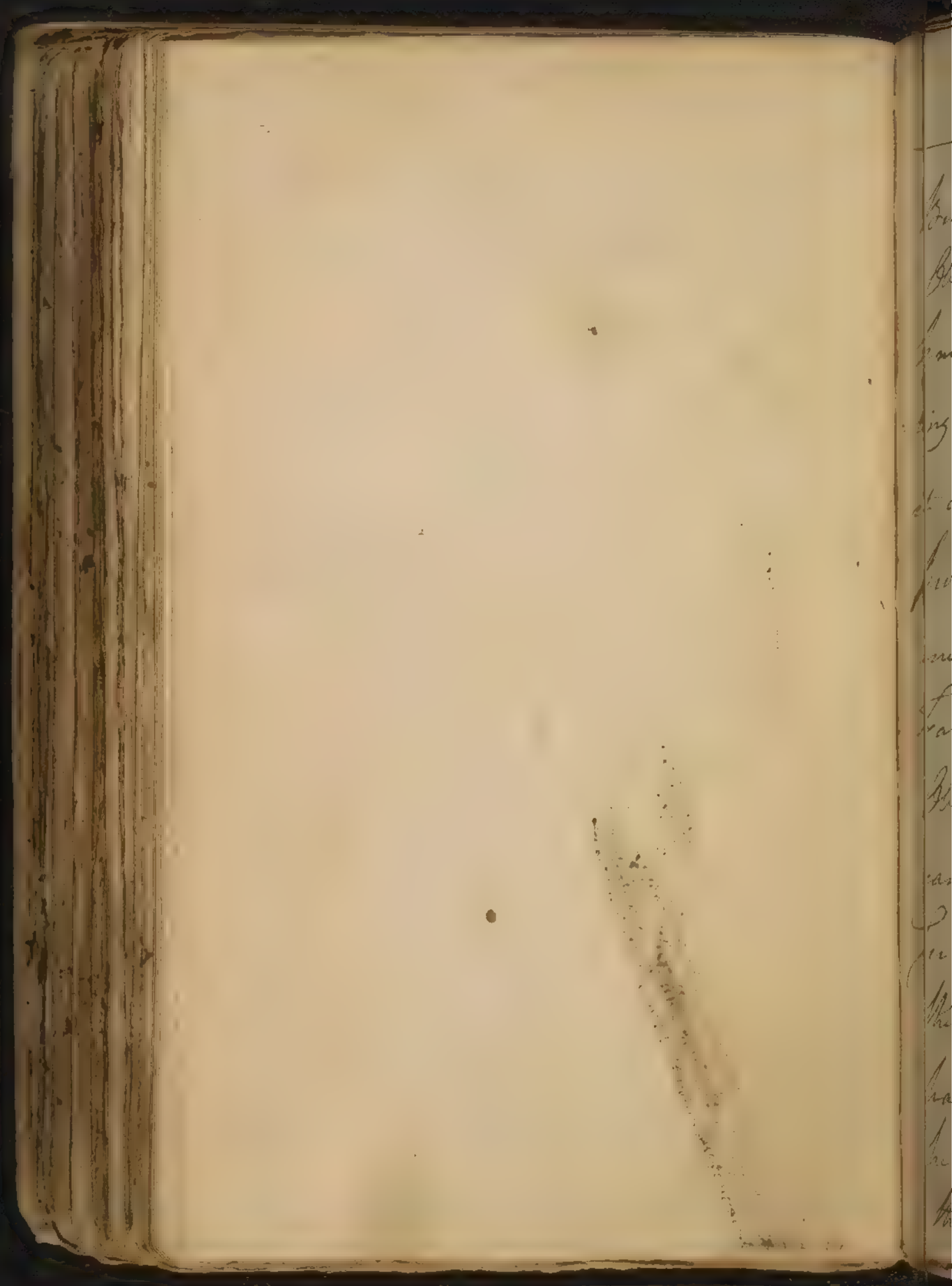
Plethora fat? Is an Apparent Plumpness  
& Fulness of the Blood. But this is ambi-  
guous as it may depend upon Fluid accu-  
mulated in the cellular Texture, hence  
Obesity & Plethora are often confounded  
especially as they are always more or less  
connected with each other & depend upon  
the same Occasional Causes. Obesity itself  
may increase Plethora especially that species  
of it w<sup>ch</sup> we called "Plethora ad Gratum".

I find it therefore very difficult to distinguish  
between Obesity & Plethora. we are apt to  
think Bile Aliment condenses towards Obesi-  
ty but we have few or no proofs of this.  
many fat People live but little ~~but~~ <sup>on</sup> ~~but~~ <sup>on</sup> ~~but~~  
Substances & many lean People live



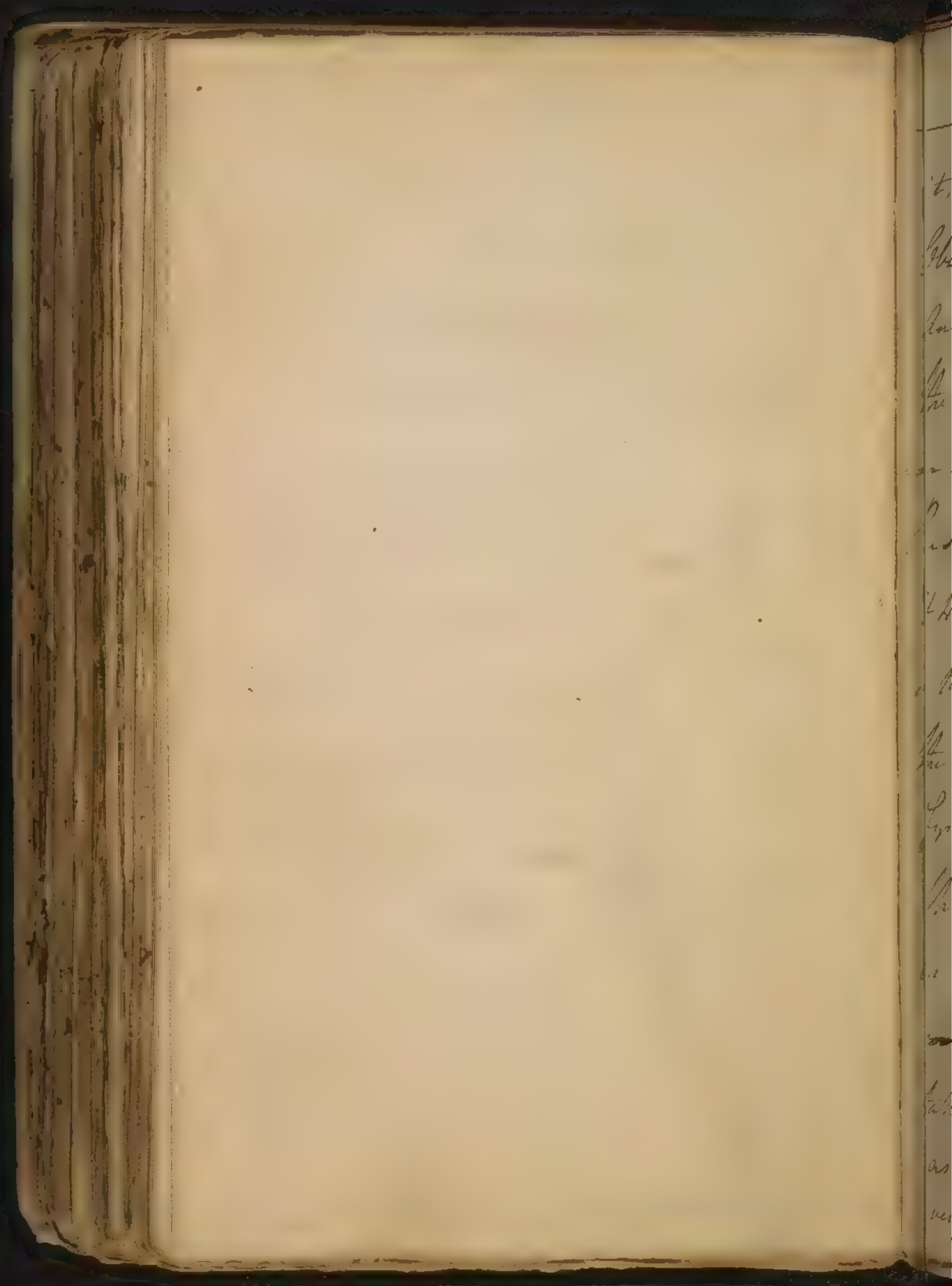


on an oily Aliment alone. Do not <sup>the</sup> assimilating power prevent the evolution of these oily parts of our Aliment? - or may not the organs <sup>th</sup> secrete this oily matter be more or less disposed to evolve it? But we know so little of this subject that we can say but little certain upon it. I formerly said Acids tend to mix the oil & water of our Aliment. May not an Over proportion of this Acid prevent the evolution of this oil. & may not an over proportion of Animal Food tend to produce Obesity by evolving ~~on~~ by its greater tendency to Putrefaction oily as well as saline matters. I deliver these things merely as Conjectures.



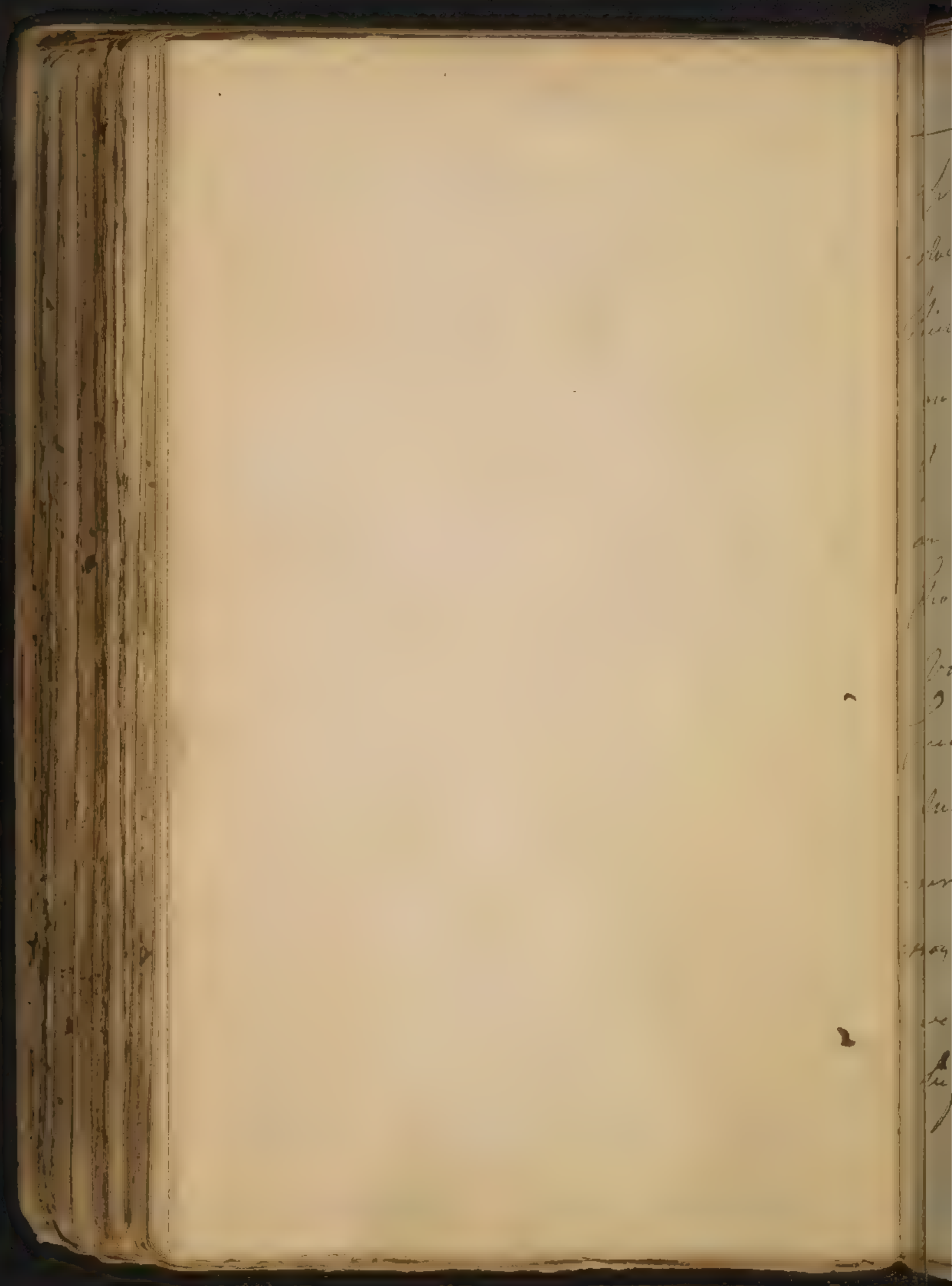


But we shall seek for other causes of  
Obesity or the reverse of it. Exercise we  
know prevents Obesity either by preven-  
ting the evolution of Bil, or absorbing  
it as soon as <sup>it is</sup> evolved. The first is most  
probable; as we find Exercise tends to  
encrease the Excretions <sup>in</sup> prevent  
Fatness. Excretions tend to prevent  
Obesity hence Nurses & Milk Cows  
can never be fatted while they give  
Milk. Other Excretions as well as  
this operate in the same way. I  
have seen Obesity follow a pitting being  
held upon. There is then a balance be-  
tween the increased secretion of Bil & the secretion

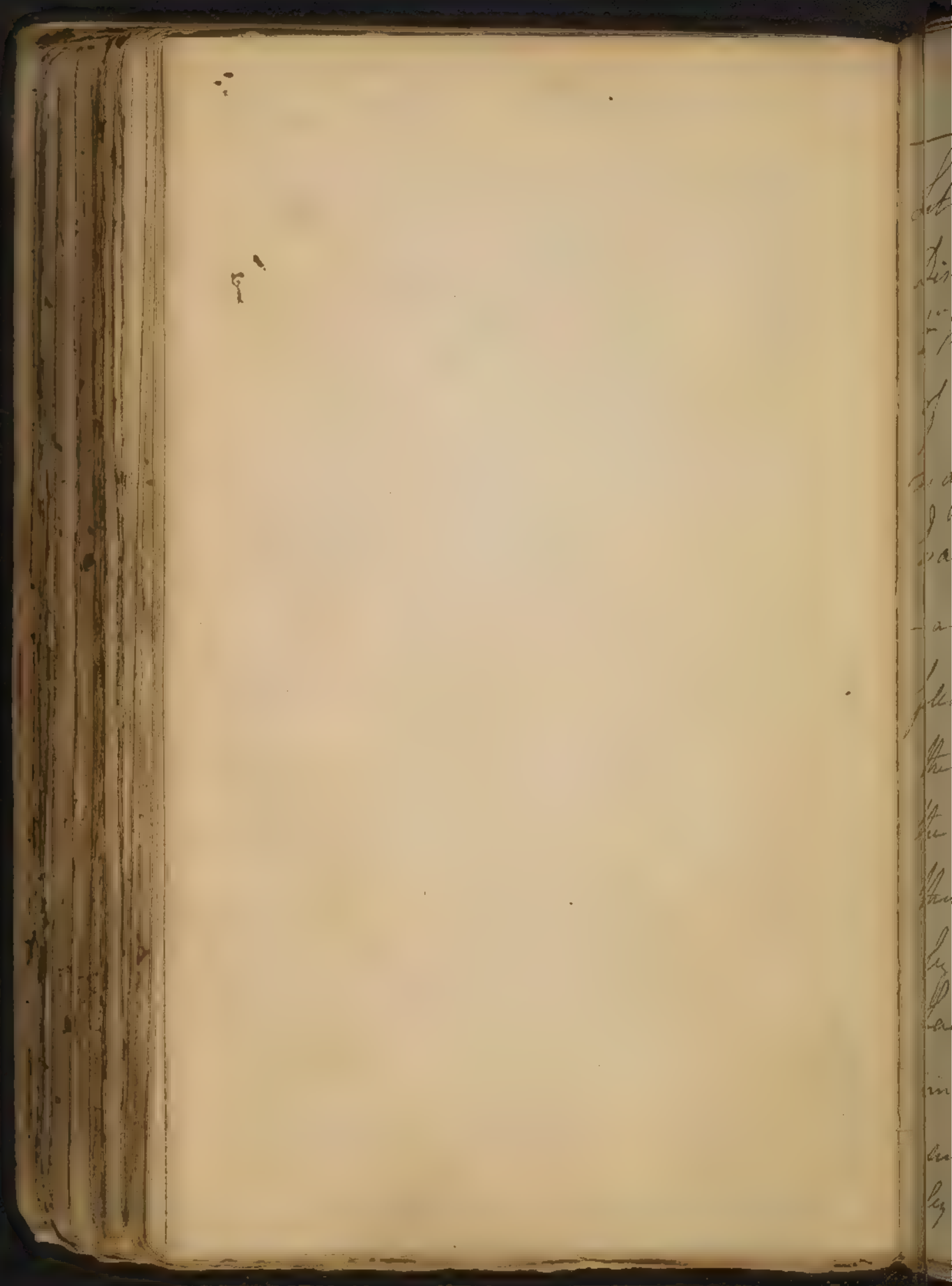


it. Hence then you see the Reason why  
Obesity & Plethora are connected w<sup>th</sup> one  
another as they evidently depend upon  
the same causes. But this is not enough  
on this subject. we often see lean meagre  
Persons grow plump & fat between 30  
& 40. at this Period the Arterial Plethora  
is taken off. It must then arise from  
the Disbalance of the Excretive & Venous  
System being destroyed. It appears then  
that the Disposition to Obesity is as great  
as to Plethora depend upon the same  
state of the System. we may therefore  
take Measures to remove Obesity as well  
as Plethora, but it sh<sup>d</sup> be attempted  
very cautiously. I have known Ladies thrown





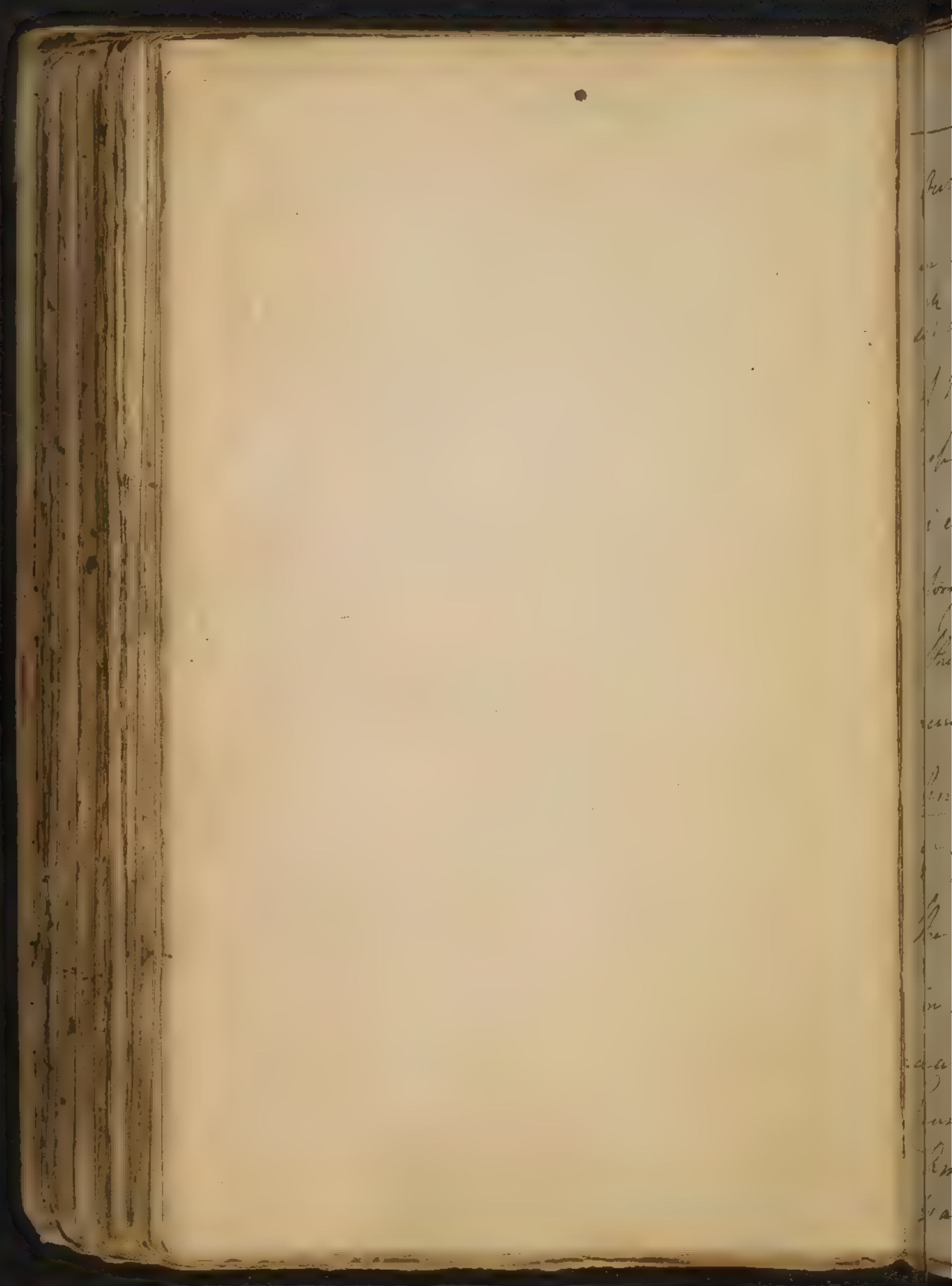
up this Dinner every day - purgatives  
 & drink vinegar to bring down  
 the Heat, but in all these Cases it is not  
 on many Diseases. The Circumstances  
 of Exercise there are only to be depended  
 on in taking down Plethora, but this  
 should be used w: the utmost Caution.  
 Vinegar & salt have been used w:  
 success to remove Plethora: but these  
 surely operate in a very contrary Man-  
 ner the one increases & the other de-  
 stroys the Acid of the System. Now shall  
 we reconcile this w: <sup>the</sup> what we said  
 before? —————





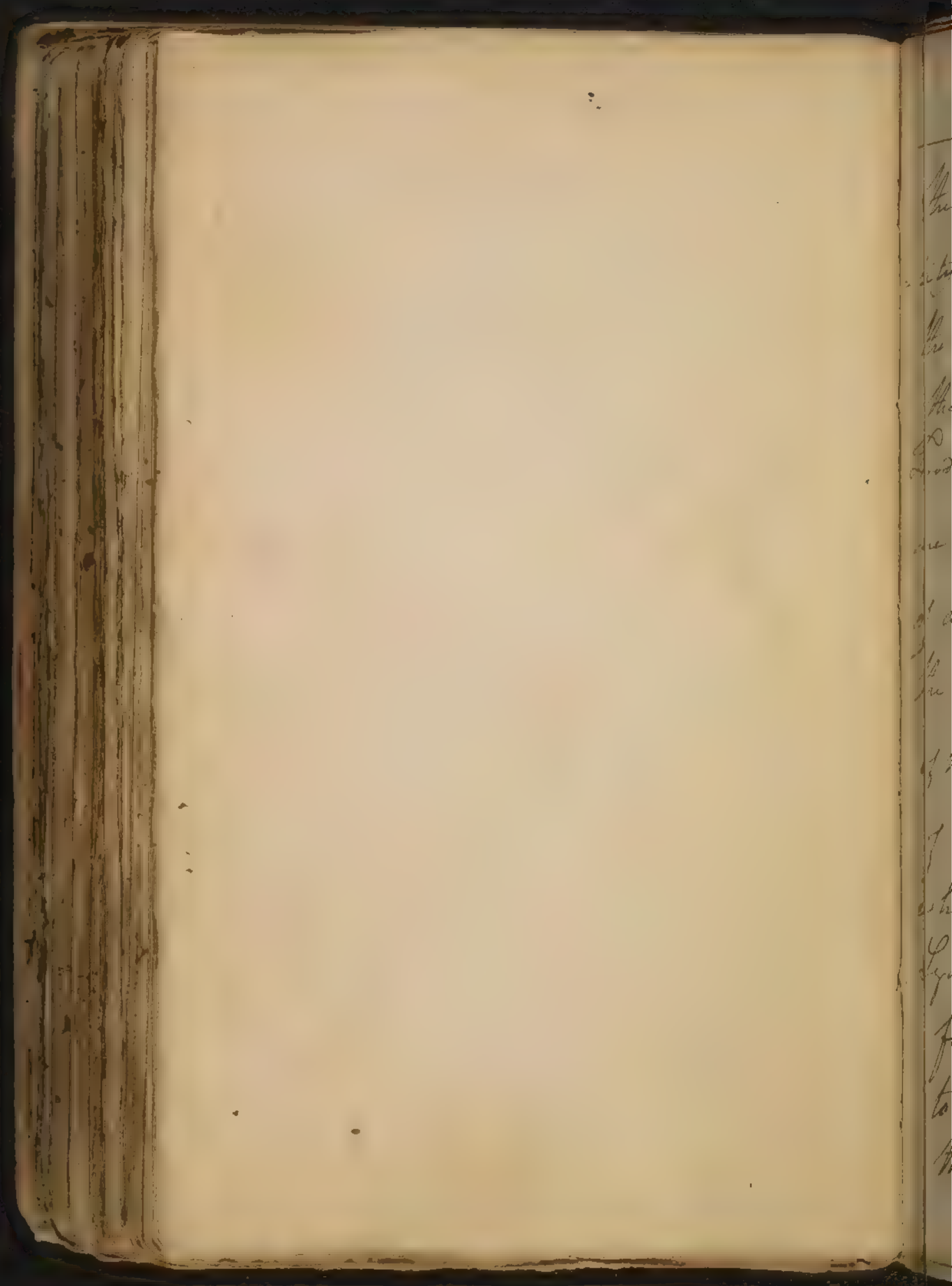
Let us enquire into the contrary Relative Diseases of the blood.

1<sup>st</sup> *Enopia Sanguinis*, or a simple want of blood in the blood vessels. This may depend 1<sup>st</sup> upon immoderate evacuations 2<sup>d</sup> a want of Aliment. - a diminished state of the Excretion generally follows a want of Aliment. but I therefore follow the balance w<sup>ch</sup> will be kept up between the Fluid & Solids. by a want of Aliment then I mean an obstruction of it either by a vomit - or Dysentery or Obstruction of Lactals after it is taken in. Or upon imperfect Assimilation. or blood of such a nature as to pass off at once by Urine or Perspiration. I shall point



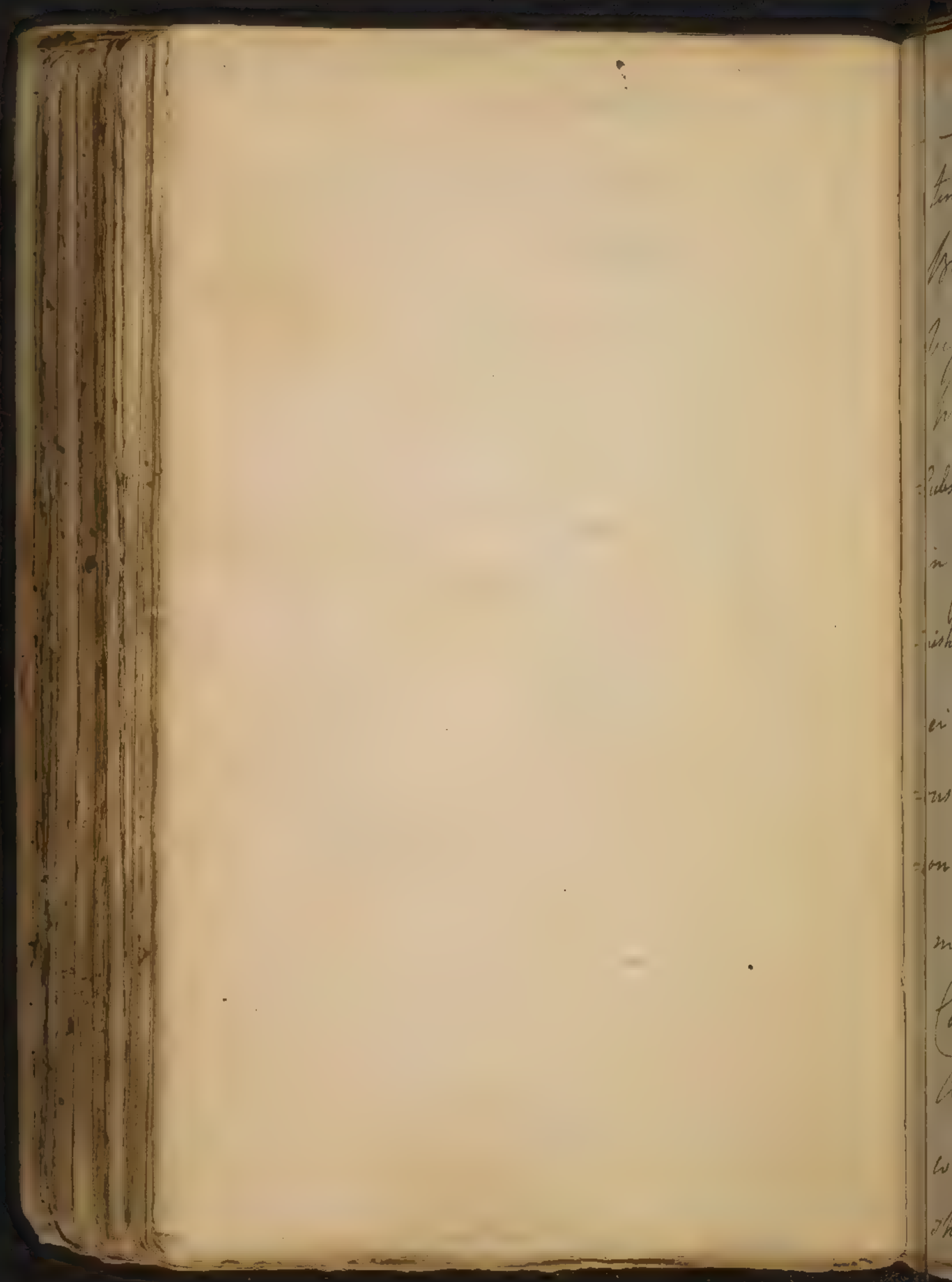
1. The want of that element <sup>ch</sup> constitutes  
the red Globules. 2. The Defect of these powers  
in the system <sup>ch</sup> form the red Globules 3. The  
various forms of Red Blood. The two last  
causes seem chiefly to operate in inducing  
Anemia. I don't know w: to say to the  
want of element, or to the <sup>ch</sup> nature of it.





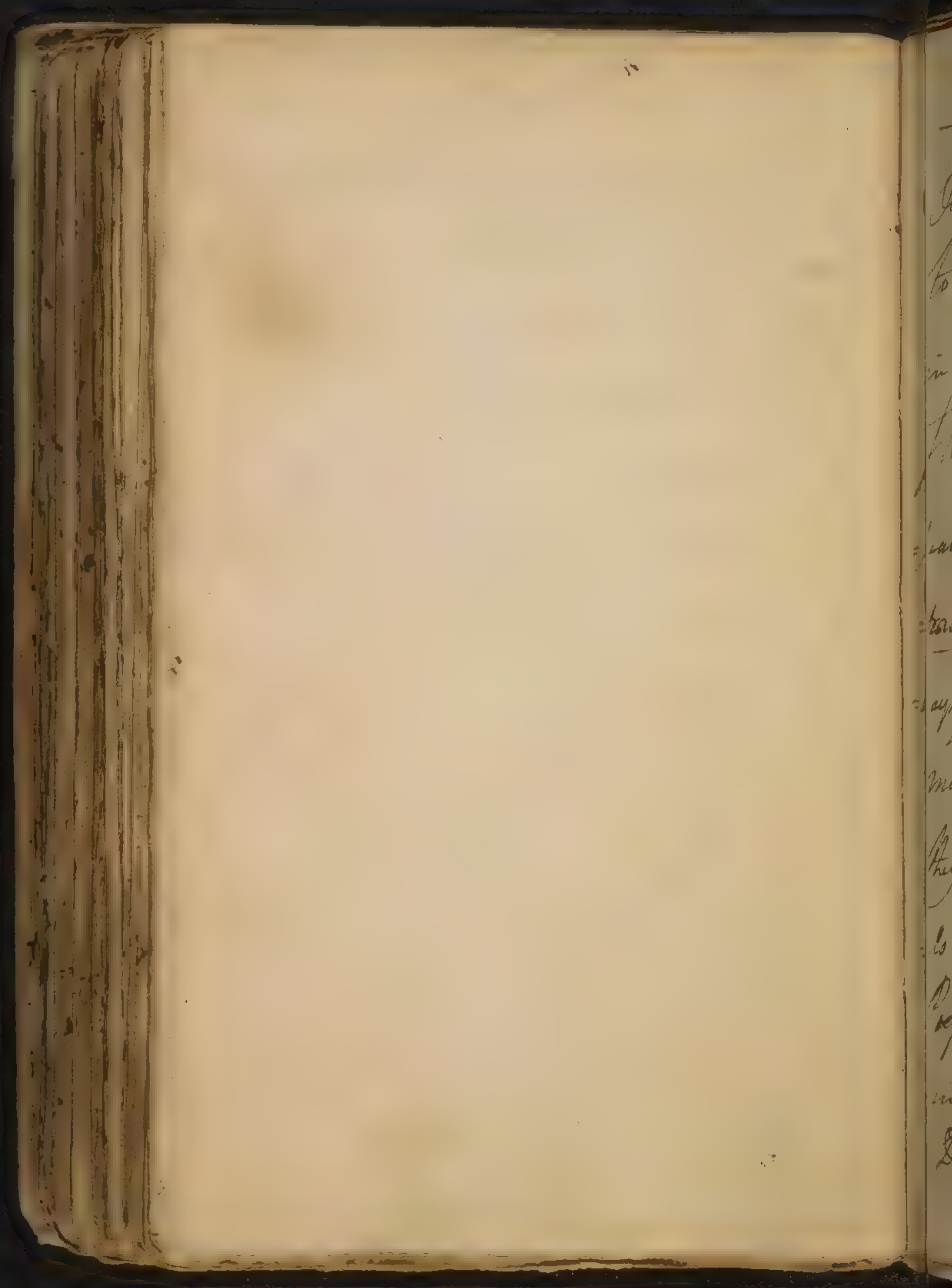
## Anemia

The Bull & the Lion have an equal Quantity of Red Globules in their Blood, as also the Peasant who lives on oatmeal, and the rich Citizen who lives only on animal Food. The powers of Assimilation then suspended are chiefly defective & the principal Cause of a Deficiency of Blood. Hence we find the Chlorosis always succeeds a breakdown of the Digestive Organs. The Consequences of this Anemia are a want of tension which induces a general Debility in the System. And if we admit the law we formerly assigned to the Red Globules viz to retain the more fluid parts of the Blood, the want of Red Globules will naturally





tend to suffer the more fluid parts of the  
Blood to escape thro' the numerous patent  
Vessels <sup>in</sup> abound all over the System. to  
prevent this Disease I believe the Red Glo-  
bules are always in a very large proportion  
in growing Animals. When they are dimi-  
nished the Fluids run off thro' every Munitory  
either internally or externally producing Ter-  
rible Discharges or Dropsies - Hence the Rea-  
son why Dropsies so often succeed Ha-  
emorrhages. How far may the want of  
Coagulable Lymph tend to bring on this  
Anemia? This Subject I formerly said  
was deeply involved in Obscurity, & I  
shall therefore pass it over. I shall only



Observe that this Anæmia always tends  
to bring on a want of Tension & Dilatation  
in the System more especially of the  
Stomach & Chest & other Organs. It ap-  
pears likewise in the Brain. Some Leins  
— Dr. Morgagni tells us that they al-  
ways found the Propria sanguinis prevail-  
ment in the Brain, & instead of Blood  
they generally found Air in <sup>the</sup> Blood: Rep.  
which detaches itself from <sup>the</sup> Ordinary  
being taken off.  
Therefore it was used to, this want of Tension  
in the Brain differs greatly to Lycohe.  
Deliquium Animi &c.





# Ima<sup>ti</sup>ation

444

I go on to speak of the Causes of Ima-  
ciation. This may depend 1 upon a  
want of Aliment & 2<sup>nd</sup> upon too great  
Exercitions. in general I think it  
depends upon an Absorption of that  
~~the~~ matter <sup>ch</sup> is excessive Fatness or Obesity  
<sup>ch</sup> may be occasioned by an excessive  
exercise introduced into <sup>2</sup> system.  
2<sup>nd</sup> upon too great Muscular Motion  
3<sup>rd</sup> Force and Circulation of the Fluids &  
4<sup>th</sup> too great Excretion of some of the  
Fluids of the Body especially Milk or  
Bile. I deliver these things as simple  
Facts, nor do I think they stand in need  
of any Proofs. —





We come now to speak of the Motus  
vitia. The motion of our Fluids is inter-  
stini and propulsive. as to  $\frac{1}{2}$  first viz

Intestine we are sure it takes place

both Mechan & Chemical. The Mechan

ical depends upon external impulse.

The Chemical upon the action of  $\frac{2}{2}$  Fluids

upon each other. The Mechan: Motion

never changes the Chemical qualities of the

Fluids, nor has it any effect only as it

influences the Chemical motion of the Fluids.

The Chemical motion may depend either

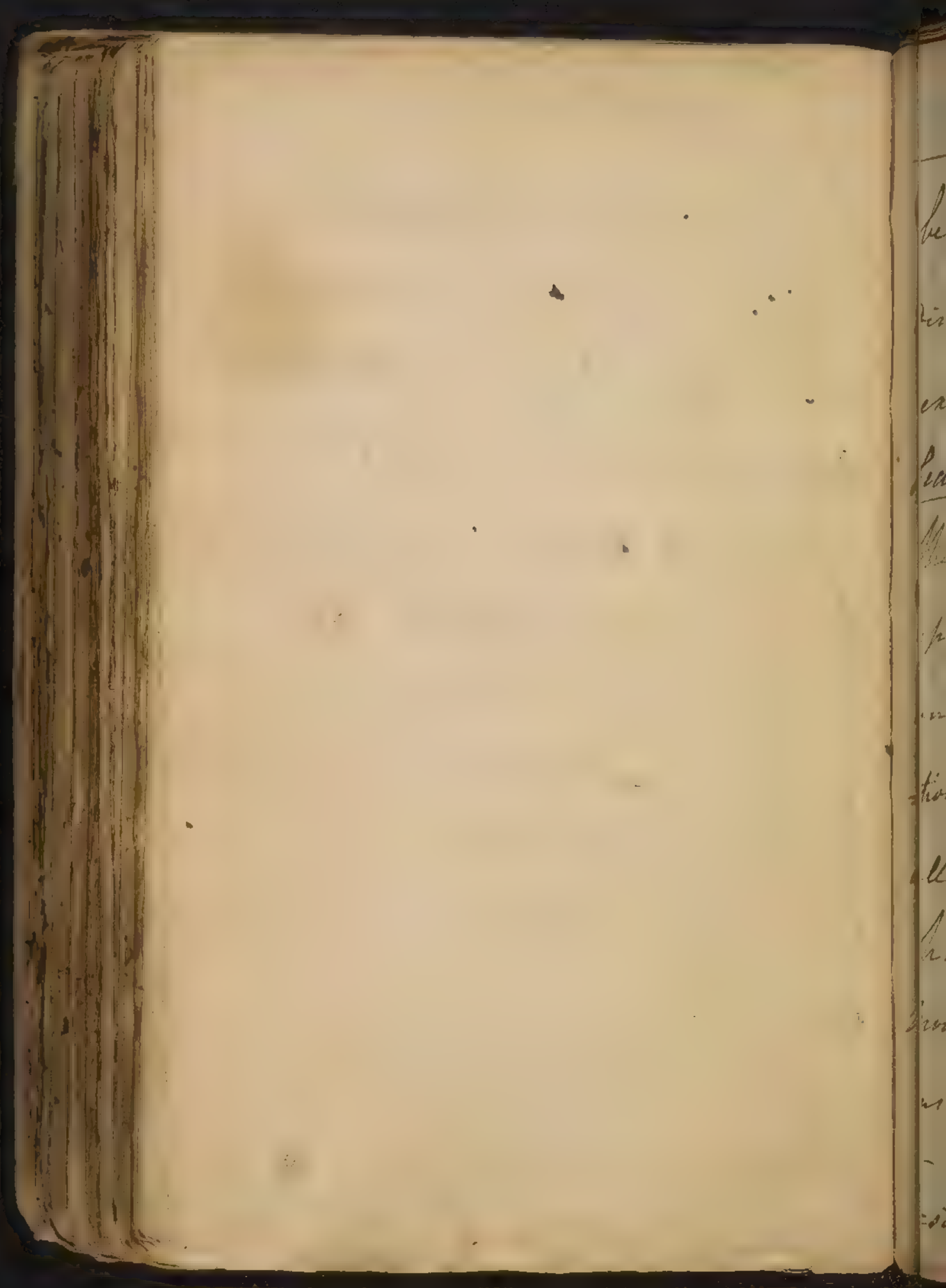
on mixture or Fermentation. in both



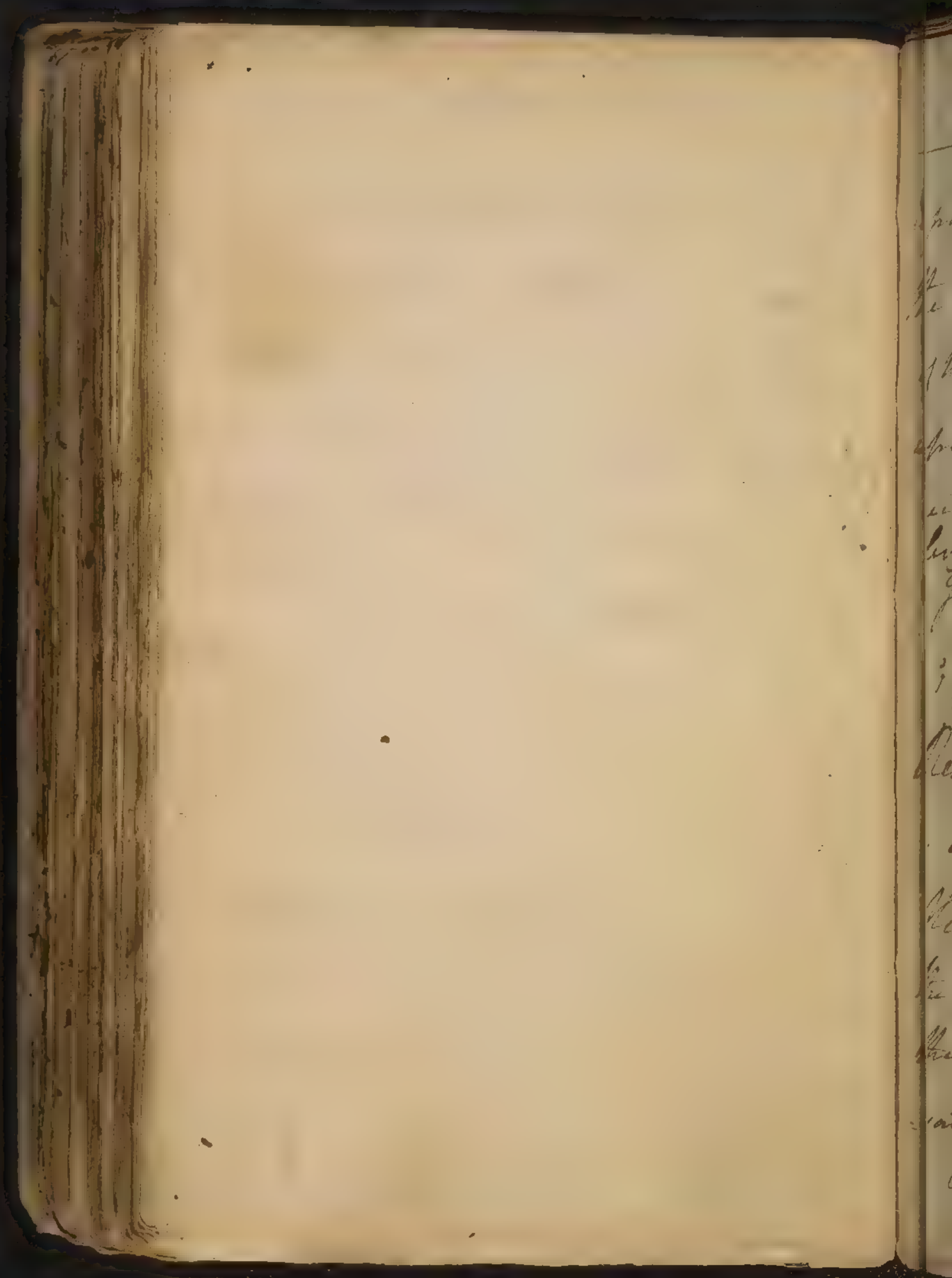
Cases it consists in Revolution & Combina-  
 tion in w<sup>h</sup> Manner these Operations we  
 cannot tell. All we can say is y<sup>t</sup> there  
 are such powers in our System but we  
 are entirely ignorant of their Modes  
 of Operation. See D. Gaurius § 407 upon  
 this subject. The Action of the Solids &  
 grant governs the Mixture of the Fluids  
 but there are Operations in them w<sup>ch</sup> are  
 quite independent of the Mechan: Action  
 of the System.

What is the Progressive Motion of our  
 Fluids? It generally depends upon the Ac-  
 tion of the Solids w<sup>ch</sup> are capable of





being excited by various powers acting  
 directly or indirectly upon them. These  
 exciting powers are mostly Stimuli, or  
Sedatives <sup>ch</sup> last sometimes indeed excite  
 the action of the Solids. This must depend  
 upon their acting in such a manner  
 on the Sensorium so as to produce a Reac-  
 tion of it upon the System & thus excite  
 all the moving powers of the System. 'Tis  
 however the first kind of Stimulus that  
 most of Pathologists refer to I mean such  
 as act directly upon the moving powers.  
 - Notwithstanding this the great progres-  
 sive Motion of our Fluids depends





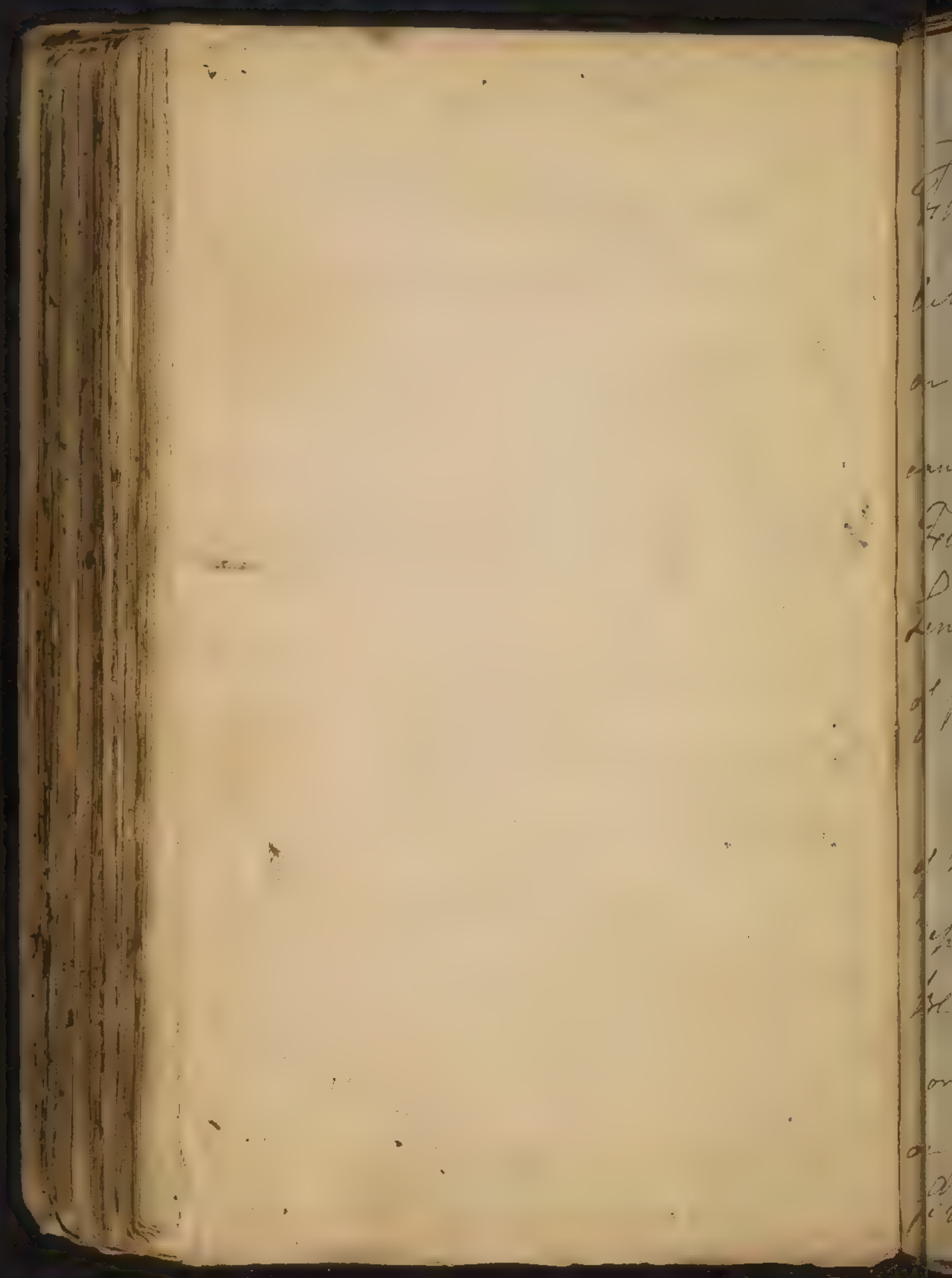
upon Stimuli that act indirectly upon  
the System. <sup>by Fever.</sup> In Boerhaave in § 186

of his Aphorisms imagines Fever depends  
upon direct Stimuli. But in this he is  
entirely wrong. <sup>he</sup> should have at same  
length said this a <sup>common</sup> ~~was~~ <sup>place</sup>. ~~He~~  
reduces the Cause of Fever to 4. ~~He~~

1 Cold, 2 Fear, 3 Contagion & 4 a  
Resistance in the Languid System.

- all these weaken the Action of the  
Heart, in such a manner as to excite  
the Reaction of the Sensorium to overcome  
the Resistance induced by the Causes before  
said.

On what does a slower Motion of



Fluids depend? on a diminished  
action of the Solids alone not depending  
on Obstruction for I do not think this  
can occasion a slower Motion of the  
Fluids, much less do I imagine a  
Lenitor or viscosity of the Solids is capable  
of producing such Effects.

on what does an increased Motion  
of the Fluids in particular parts of <sup>the</sup> Body  
depend? I upon an Inequality of <sup>the</sup>  
Blood's Distribution from the greater Vicinity  
or Distance of parts from the Heart  
or from their more oblique or direct  
situation. 'tis upon this Reason



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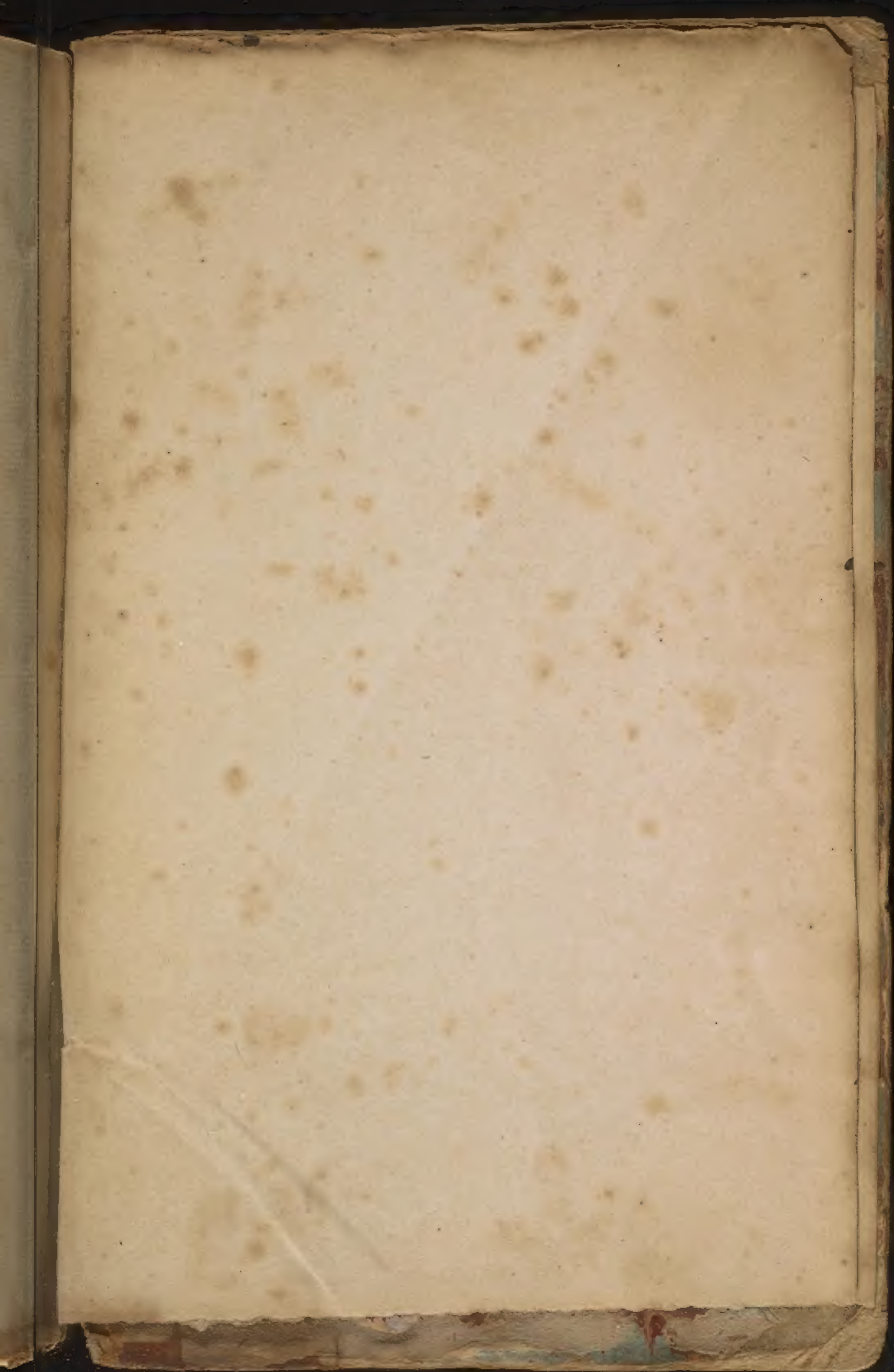
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# Index

Digestion	page 205.
Blood	215.
Function	243.
Nutrition	251
Pathology	287.
a disease what?	288.
Causes of Diseases what?	293.
Symptoms of a Disease?	302
Diseases of the Solids - Viva	313.
Diseases of the Fluids.	354
Fever its proximate Cause	420
Relative Diseases of <sup>L</sup> Blood	426
Plethora	433
Enamia	439
Motus vitia	445









22



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20



